



# Healthcare Data Analytics for better care and cash flow



**13** years in Healthcare,  
**29** years in BI & Data Science



**500**  
employees



Customers in **30+** countries,  
including Fortune 500 companies

ScienceSoft is an international IT company, an expert in **design**,  
**development** and **delivery** of healthcare IT solutions

# Companies That Use Our Software

## Healthcare

**Baxter**

 **CONWORX**  
Competence in Healthcare

**MDxHealth**

  
**PerkinElmer**

 **CHIRON**  
HEALTH

**HEALTH**  
**GROUP**  
- det starter med viden

  
**saratoga bridges**

## Other industries

**IBM**

**ebay**

**rh** Robert Half

 **RBC**  
Royal Bank

*Leo Burnett*

 **NASA JPL**

# Whom We Serve



Hospitals



Outpatient centers



Private practices



Retirement homes



Nursing homes



Home care agencies



1

Reporting to CMS  
and complying with value-based care model



2

Defining  
profitability of different patient segments



3

Finding and fixing  
problems in internal clinical processes



4

Identifying  
best practices of facilities, doctors and nurses



5

Predicting and  
eliminating patient satisfaction gaps



# What to Analyze



Outcomes



Patient-generated health data (PGHD)



Costs



Internal processes



Finance

## Performance-based outcomes measures



Length of hospital stay, time to return to work, readmissions, mortality, etc.



## Patient-reported outcomes measures

Quality of life, health status, patient satisfaction and experience, pain, etc.

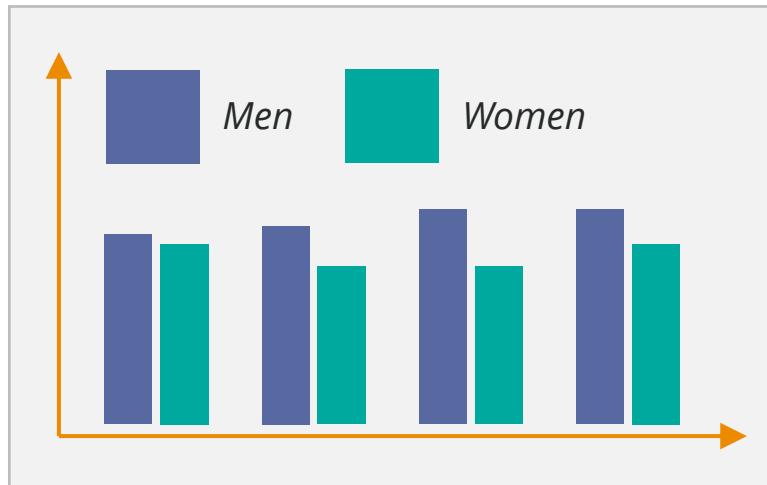
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### Data sources:

- ◆ EHR / EMR
- ◆ ADT
- ◆ Department-specific systems
- ◆ Chronic disease management / population health management

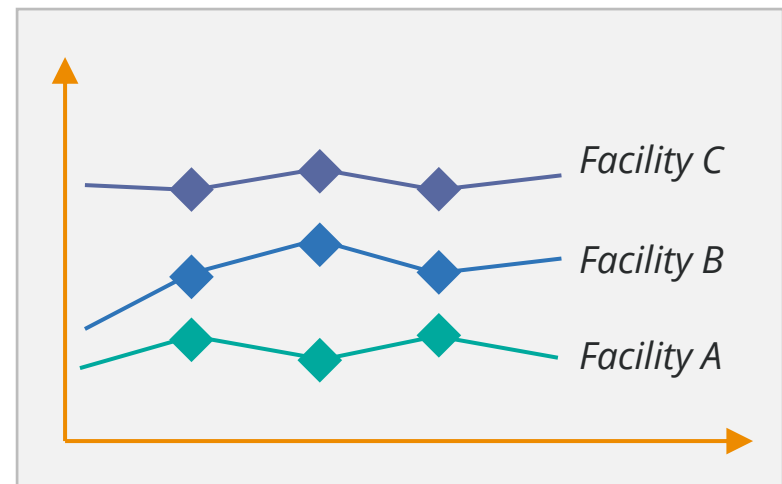
### Measure sources:

- ◆ National standards (CMS, AHRQ, NQF, etc.)
  - ◆ Internally developed measures
  - ◆ Custom measures developed together with ScienceSoft
-

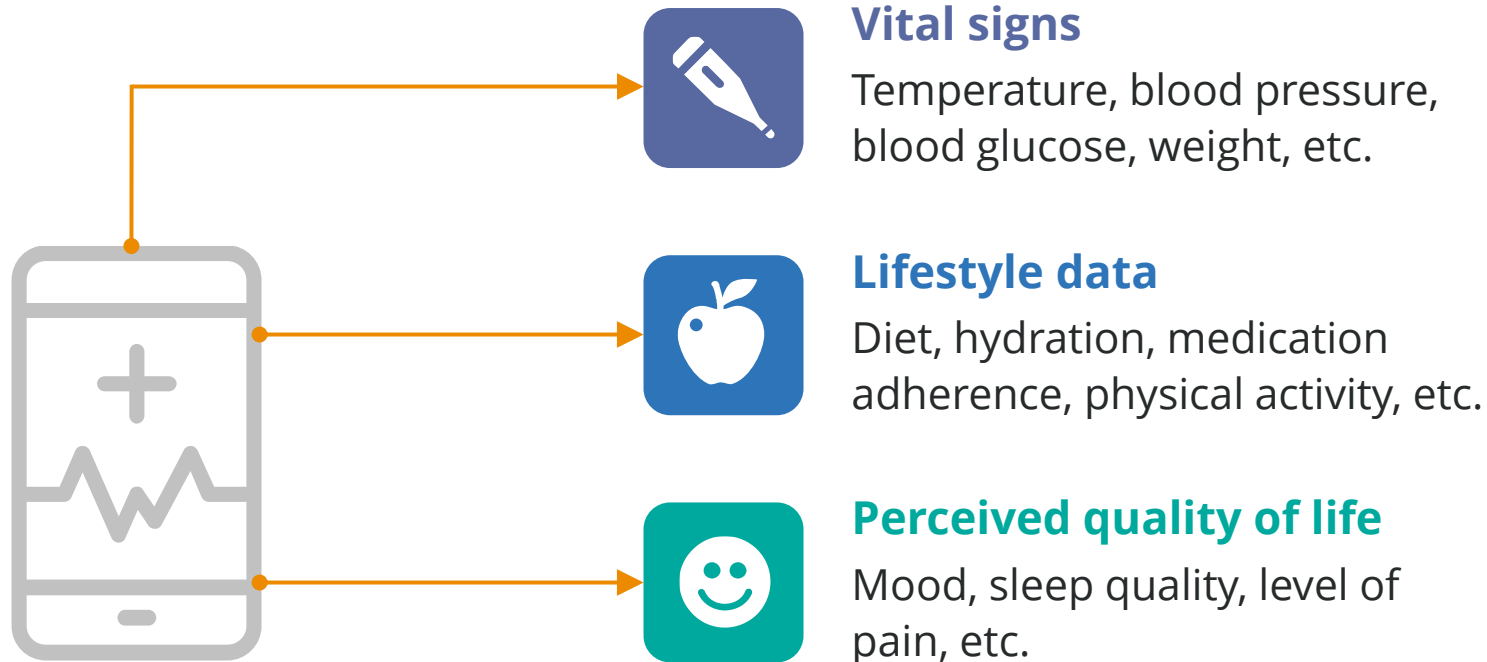


Outcome variations based on **demographic factors** (gender, age, income level, lifestyle)

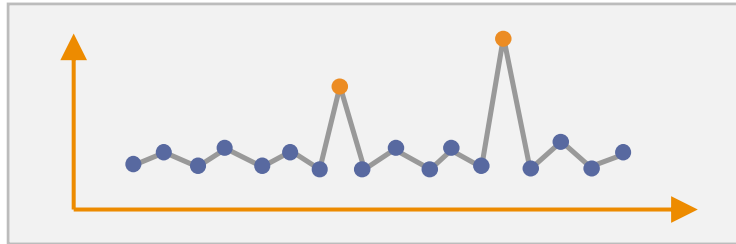
Outcome variations based on a **health organization's internal factors** (a specific physician, treatment, facility)





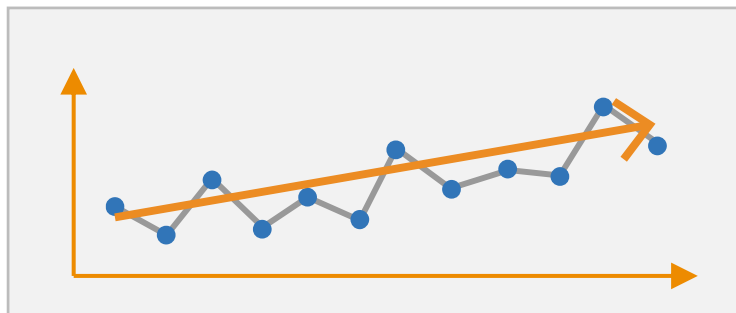


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- Data sources:**
- ◆ Patient mobile application
  - ◆ Patient portal
-



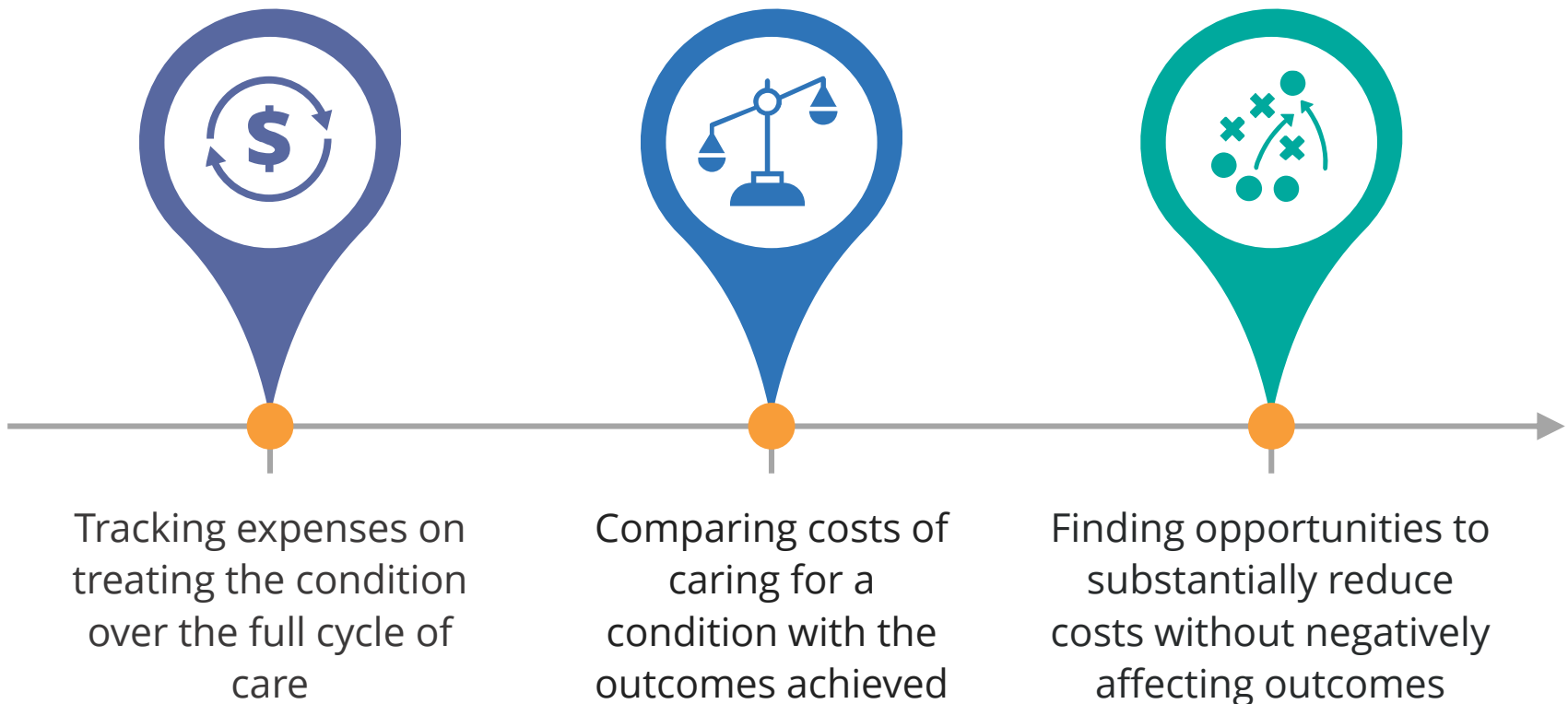
**Abnormally high or low** blood glucose levels (for diabetes patients)

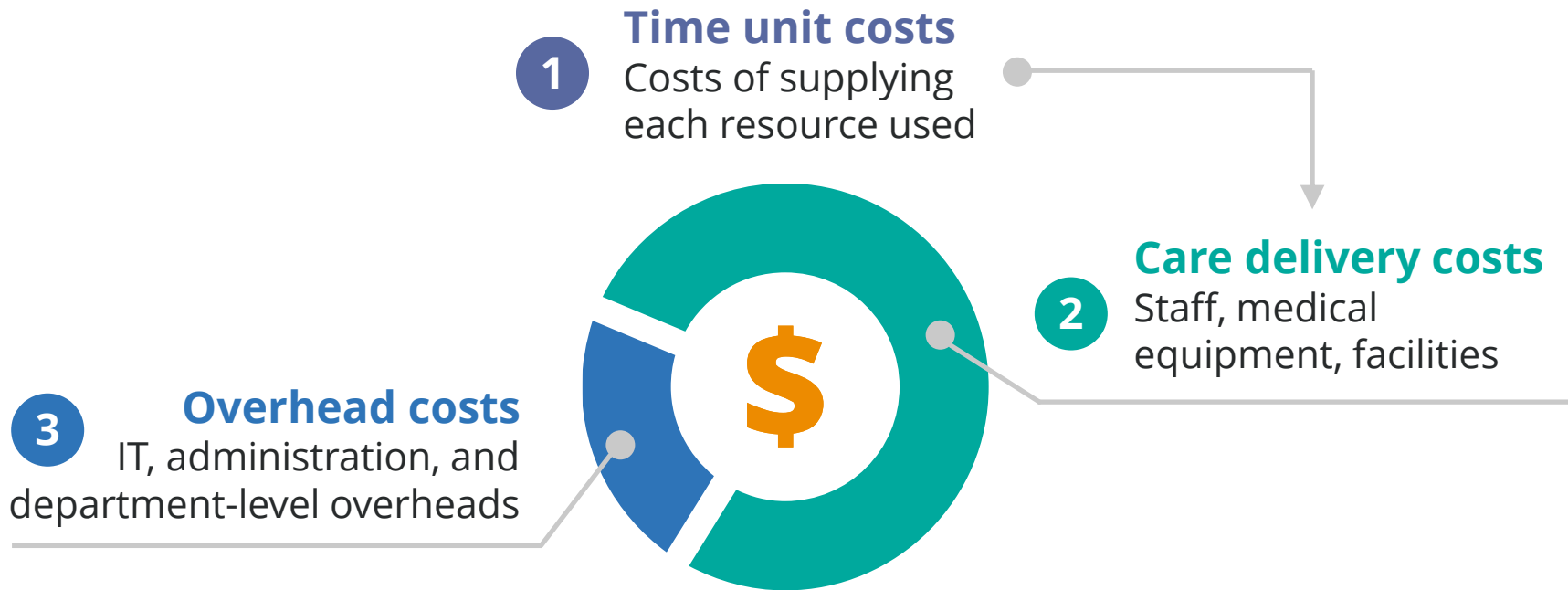
**Significant** SpO2 level changes (for COPD patients)



**Overall trends** in patients' nutrition, hydration, temperature, weight, blood pressure, etc.

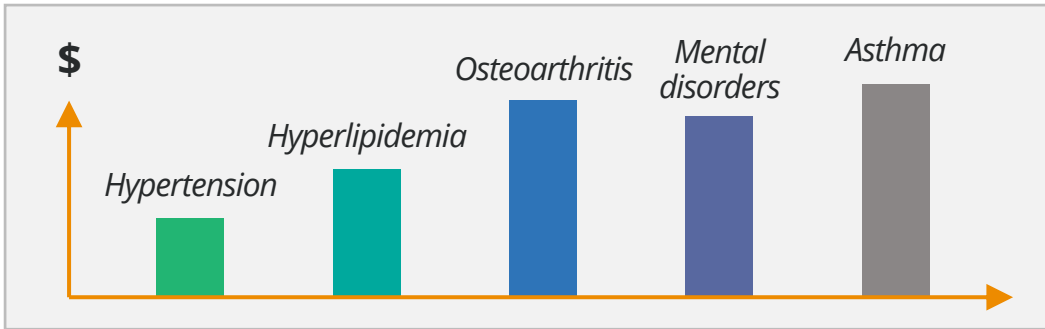
To determine the real cost of health care, caregivers must measure **costs for the episode**, not for departments, services, or line items





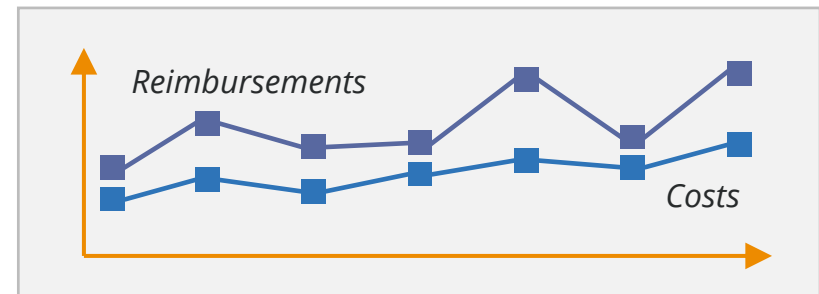
**Data sources:**

- ◆ EHR / EMR
- ◆ LIS
- ◆ RIS
- ◆ Department-specific systems
- ◆ Accounting system / ERP

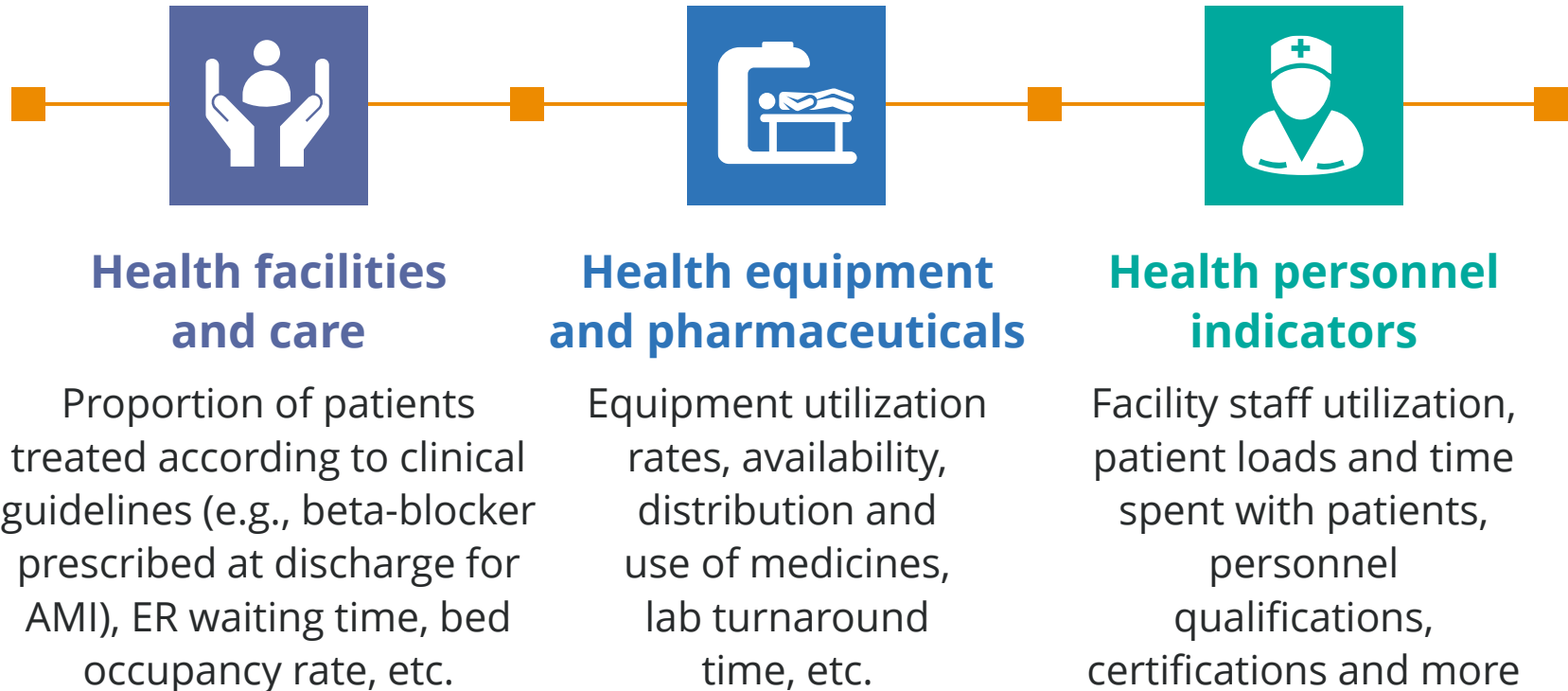


Variations of expenses for treating **specific conditions**, supported with data on each patient

**Relationships** between **costs and reimbursements** covering certain periods



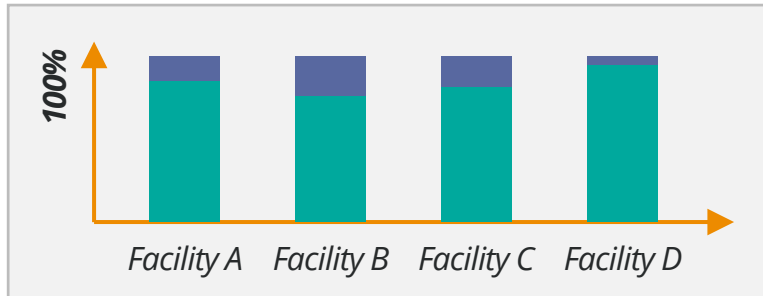
**Relationships** between **costs and outcomes** covering certain periods



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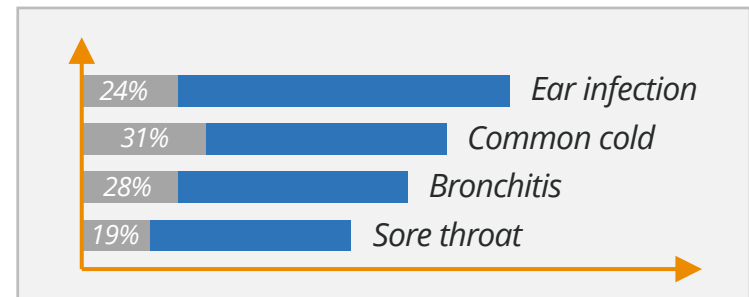
**Data sources:**

- ◆ PMS
  - ◆ EHR / EMR
  - ◆ LIS
  - ◆ RIS
  - ◆ Workforce management system
  - ◆ Department-specific systems
-

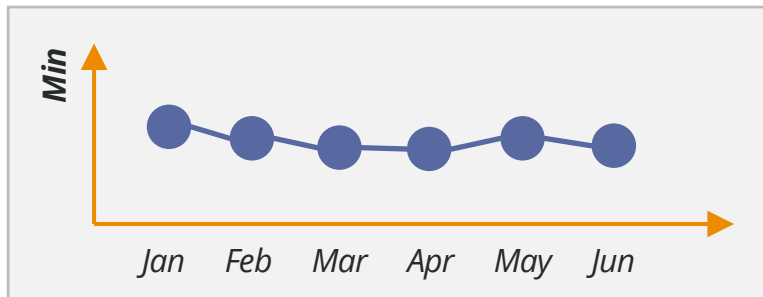


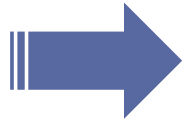
▶ **Proportion of patients** with diabetes given **regular foot care** (by specific facilities)

**Unnecessary use** of antibiotics (by specific physicians, diseases, facilities)



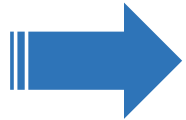
▶ **Median time to transfer to another facility** for acute coronary intervention





## Profitability indicators

Total margin, cash flow margin, return on equity, operating margin



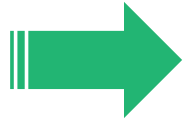
## Liquidity indicators

Current ratio, days cash on hand, net days revenue in accounts receivable



## Capital structure indicators

Equity financing, debt service coverage, long-term debt to capitalization



## Revenue indicators

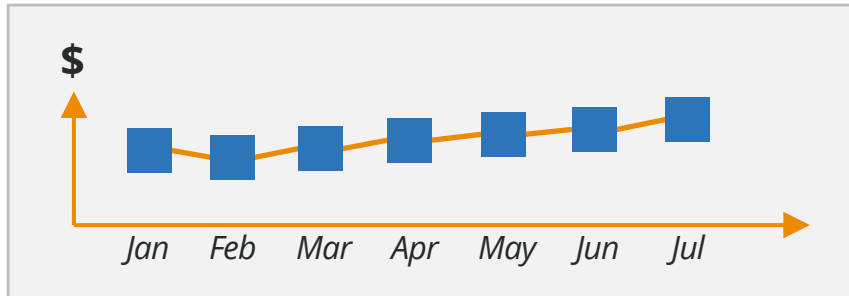
Outpatient revenues to total revenues, hospital Medicare outpatient cost to charge, Medicare acute inpatient cost per day, etc.

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### Data sources:

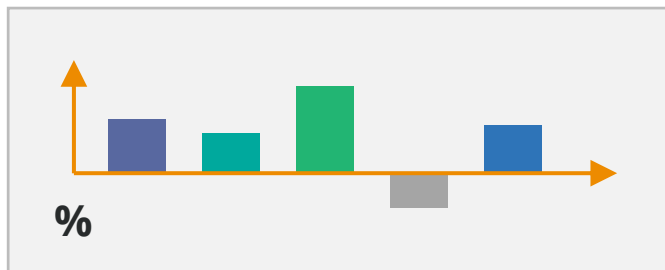
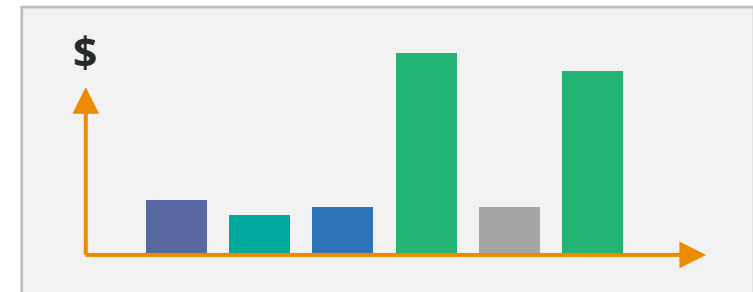
- ◆ ERP or FMS
  - ◆ Revenue Cycle Management
-





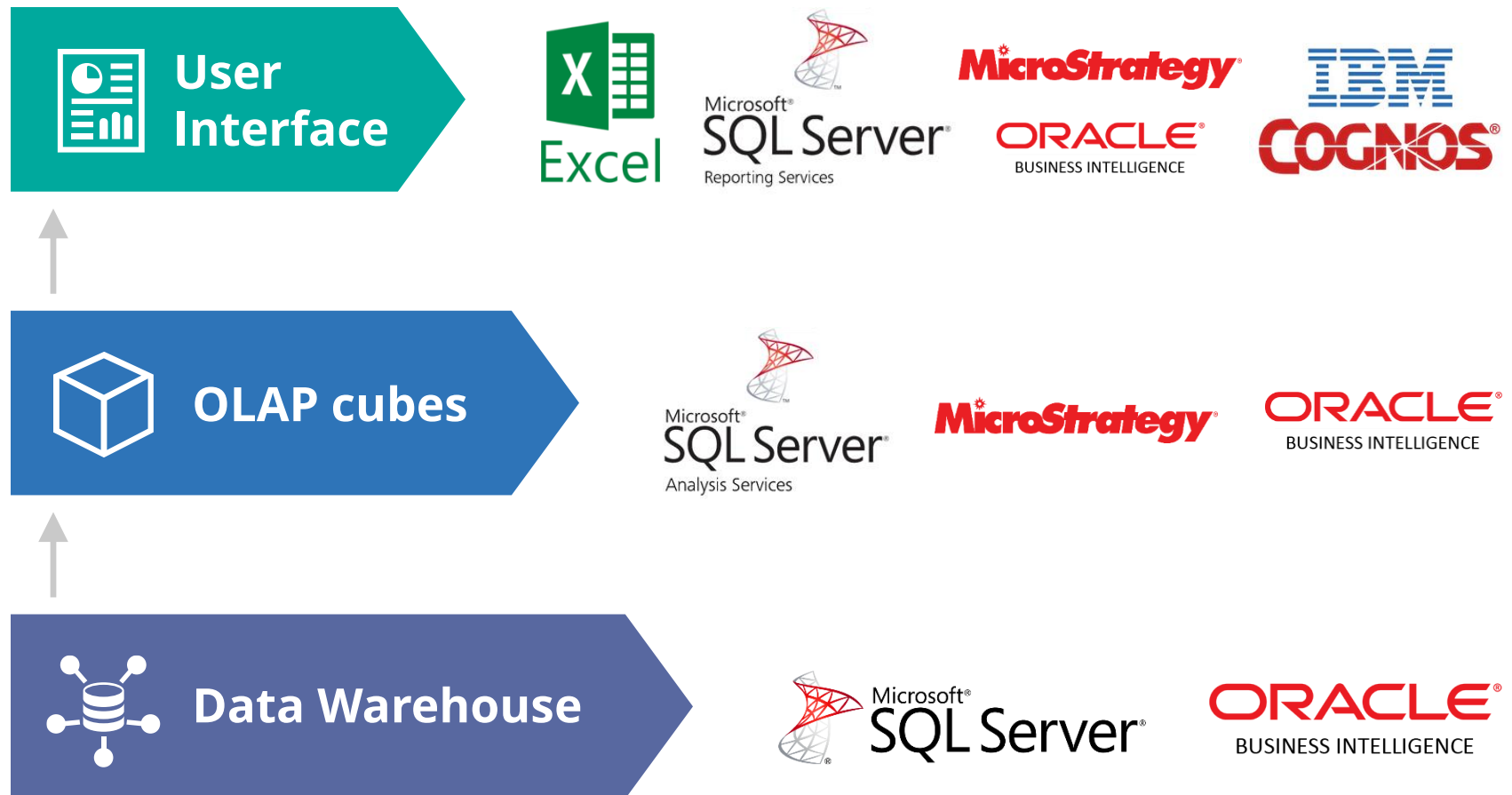
▶ Actual cash flow

Outstanding payments by specific payers (departments, facilities, diseases)



▶ Actual ROI by types of investments (new facilities, medical equipment, such as CT or MRI, etc.)

# Levels of Technical Implementation



The **advantages of enterprise-wide BI solutions** over analytical tools built into EHR, RCM and other systems:



Offering complete understanding of clinical, operational and financial processes



Finding cause-and-effect relationships between internal processes, quality of care and cash flows



Adapting to changing business needs (such as transition to a value-based care environment)



## BI for 200 Healthcare Centers



Customer



200 US  
healthcare  
centers and  
retirement  
homes



Solution



System of 200 databases  
for data management  
and reporting on  
medication inventory,  
clinical services, patient  
data, marketing activities  
and others



Tools & Technologies



MS SQL Server, Transact-SQL, JReport

## Health Monitoring Module for Caregivers



Customer



Solution



US assisted living organizations



A health monitoring module to automatically collect, store and analyze patients' vitals and test results, as well as send alerts on negative changes to a patient's condition

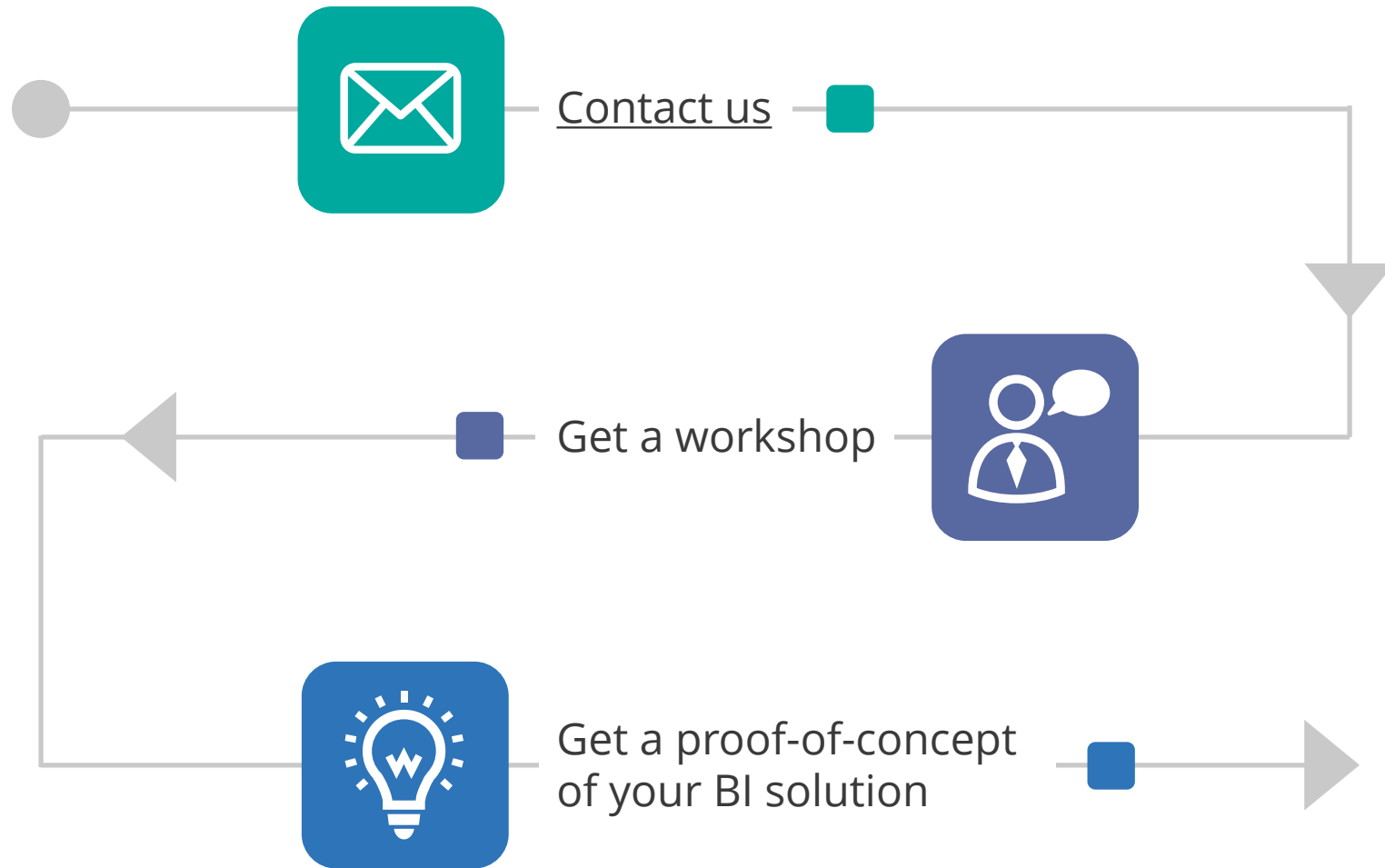


Tools & Technologies



Ext JS, Sass, Java, Spring, Hibernate, Apache Maven, Apache Tomcat, MS SQL Server





# Let's Keep in Touch!

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