

# LITERATURE SURVEY

## 1. Hospital health care data using sql

An analytics team member needs to be able to talk directly to and manipulate databases through structured query language (SQL). Recognizing there are various dialects of SQL, I refer generically to the ability to speak to and manipulate databases through code. He should be able to write SQL code without a dependency on an intermediary, guided interface (e.g., a drag and drop tool). Many analysts rely on tools like [Microsoft Access](#) or [Crystal Reports](#) GUI interfaces to generate SQL for their reports. In doing so, they attain a rudimentary understanding of querying. SQL offers users fine-grained control of the data being pulled. It also provides a powerful way to explore data that isn't filtered through a predefined data set or model, as is the case with a business intelligence (BI) tool. Teams that can't query the data with SQL are beholden to whatever information is pushed to them from another source. Using a BI tool to generate SQL on your behalf is a good starting point.

There are a couple potential downsides to using auto-generated queries from BI tools, though. First, these tools usually underperform because they are poorly constructed (behind the GUI interface). Second, and far more prevalent, is the way these tools mistakenly make assumptions about the data and manipulate the data without the user being aware of the underlying logic. This is dangerous because he may not understand the query generates duplicate result sets (i.e., tables), or excludes some patients that should be included in the result set, or a host of other "I didn't realize it was doing that" scenarios.

If your query feeds a report, and the report provides information people will act upon, you need to be sure you really understand the logic embedded in the underlying query.

## 2. Hospital health care data analytics using ETL

**Export, transform, and load (ETL).** The health data analyst needs to be able to perform export, transform, and load (ETL) processes. Simply put, he needs to take data from one system and put it into another. In an EDW, a user pulls data from disparate systems that don't talk to one another. For example, you may have an EMR system, a patient satisfaction system, and a costing system that don't interface directly. Making a copy of the data found in each of these systems and pulling the data into the warehouse will allow integration of data from the various systems. This movement of data is accomplished through the ETL process.

## 3. Hospital health care data using data modelling

**Data modeling.** Data modeling is a fancy way to say that an analyst can write code that models real-world processes and workflows. Let's consider a common healthcare scenario: a hospital admission. What information do I need to capture to model that workflow? In this example, you'd need some demographic information, such as the patient's name, data of birth, gender, and complete address. You'd likely want to pull insurance information, such as the plan name, copay amount, and effective coverage date. Clinically, you would want to know some history. Is this patient new to the system? Do we already have a medical record

number for the patient (indicating we have seen her before)? What is the admitting diagnosis? Who is the attending provider for the admission? Did the patient come through the emergency department or some other venue? A good data model captures all of these data elements and relates them in a meaningful way to reflect the actual workflow.

## 4.hospital health care data analytics using data analytics

**Data analysis.**An analytics team member needs to be able to make sense of the data once it is in the EDW. There is so much information produced in healthcare, and not all of it is relevant for an analysis to drive improvements. A good analyst has the ability to sift through data to extract pertinent insights. This requires some complex thinking around set theory and the ability to do his analysis through SQL, a statistical reporting tool, or a combination thereof. In healthcare, there is a lot of attention to the [management of diabetic patients](#). Diabetes is a chronic condition that affects the patient's quality of life, and if not well managed, can be lethal. From a financial perspective, diabetes is extremely costly if mismanaged.

An analyst may be part of clinical improvement team tasked with managing diabetics within the health system.

A health system may be managing a large population of diabetics that may be stratified into low, medium, and high-risk stratifications. Clinical markers called out by physicians determine the *classification* of patients into one of these three categories. But what if the health system wanted to know more, such as its total number of diabetic patients? How many of these patients are in each category of risk? What is the movement of low to medium risk on a year-over-year trend? How about the trend of movement from medium to high risk?

An analyst will be tasked with [mining the available data](#) to answer these questions *and* will add tremendous additional value if he can highlight potential reasons that explain the “why.” Why the movement from low to medium? What statistical correlations can be drawn and then effectively tested? A health data analyst fills that role for the team.

## 5.Hospital health care data analytics using Business intelligence

**Business intelligence (BI) reporting.**An analytics team member needs to be able to present data in a way that's intuitive to nontechnical users. The visual representation must be simple to interpret by a lay audience. While this sounds simple, this skill is difficult to execute well. It separates an average analyst from a stellar one.

In a real sense, this is akin to being an interpreter. An interpreter hears words spoken in one language and then speaks a different language to the target audience. Without a strong mastery of both languages, translation is difficult, if not impossible. Apart from the mechanics of words, language rules, and semantics, there are embedded nuances, such as metaphors or idioms that further enrich the communication experience. An excellent interpreter demonstrates the ability to perfectly convey *meaning*, not just words.

Likewise, the data expert needs to translate database speak—that is mining data to find meaning—into simple graphics that perfectly convey the meaning, all while avoiding potentially ambiguous conclusions.

## 6. Hospital health care data analytics using data visualizations

**visualizations.** The analytics team member must be able to effectively communicate stories embedded in the data. Think of it this way: BI reporting gives you contextual meaning in bits and pieces, or a micro view. Telling the story, however, means providing a logical flow to tie together lots of meanings to create a big picture view. Let me further illustrate with an example.

Research indicates that one of the clinical best practices for diabetic patients is to perform a hemoglobin A1C (A1C) test on a patient's blood on a yearly basis. Other best practices include getting a yearly eye exam, foot exam, and a blood pressure evaluation.

A data expert tasked with reporting on A1C testing, eye exams, foot exams, and blood pressures gives meaning to the data elements capturing these measures. The analyst scours databases to find all the possible ways that A1C results are represented in the EDW. The same exercise is done to find eye exam, foot exam, and blood pressure data. The skill of BI reporting helps clinicians and care managers identify patients that have care gaps (e.g., patients missing eye exams, foot exams, A1C testing). These are meaningful measures, but are really just part of a bigger picture.

Telling the story in this example means helping the organization see how well it is managing its diabetic population through evidence-based medicine. Telling the story takes into account all of the measures (e.g., A1C testing, blood pressure testing, eye exams) across the entire managed population and finds where the system is doing well, or where there is variation in care delivery. Telling the story also means looking at clinical and financial outcomes. Just because a system is really good at delivering care, doesn't necessarily mean all outcomes are optimal. At what cost is the care being delivered? Perhaps the clinical outcomes scores are noteworthy but not financially sustainable. Telling the story means calling this out and [using data to suggest ways to reduce cost](#) without sacrificing quality.