

Enterprise Analytics Transformation Plan

Organization Overview

Gillette Children's hospital is a small independent pediatric hospital in St. Paul, Minnesota that provides specialty healthcare to focus on interventions to care for rare, complex, and/or traumatic conditions.

Project Description: Develop data pipeline to enterprise data warehouse

The demonstration project will migrate and set up pipelines for data that is currently stored in spreadsheets to an enterprise data warehouse that will handle all of Gillette Children's hospital's data. Currently, most clinical practice decisions are made by looking at data kept in spreadsheets, where it is siloed and almost impossible to use for organization-wide metrics due to a lack of standardized notation and low data quality. The immediate projected outcome of creating a data pipeline into the Data Warehouse is to increase efficiency around reporting and monitoring metrics as well as improve the ease and quality of decision making.

Role in EATP

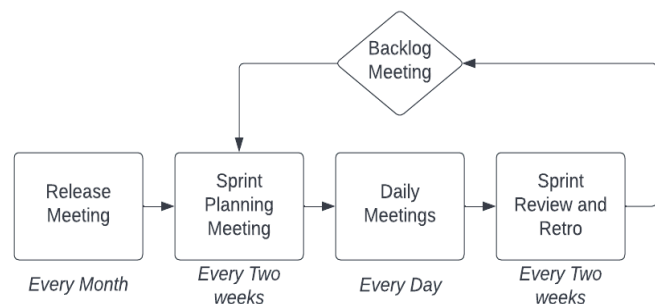
Gillette Children's Hospital has an opportunity to grow the analytics into an analytic competitor when comparing the analytic maturity against Eckerson's Analytic Maturity Model (Eckerson 2012). The migration of clinical data into an enterprise data warehouse will allow the hospital to increase the scale and scope of data utilization as well as increase the maturity of the analysis that can be developed from the enterprise-wide access to data. With these improvements to analytical maturity, we will move Gillette Children's along the maturity model by increasing the analytic potential and into an institution providing high analytic value for our patients, families, and the overall hospital. After the clinical data warehouse has been in use for some time with more data available on different medical conditions, we can then start the work of developing models to predict the effect of treatment outcomes and create better roadmaps for patient care.

Artifact

The artifact that will be produced from the data enterprise warehouse will be a standardized report that would measure the impact and change of the treatment option. The report will allow the comparison of outcomes across similar patients and show the measured effect of each intervention for similar patients.

Setting the Stage

To accomplish our project, we will form a team to execute the work according to Scrum, or agile, principles. The figure on the right shows the cadence this team

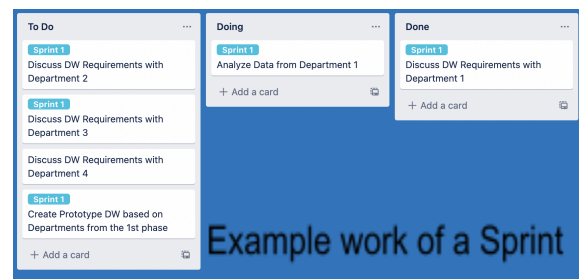


will follow, with daily meetings to review the status of the work, and two week sprints to accomplish work scoped out for that “Sprint.” To allow the scrum team to work effectively, they will need access to the transactional clinical data coming out of the electronic health record. There will need to be access to the clinical teams entering this data to understand the workflow for data entry to ensure the data integrated into the enterprise data warehouse is accurate. The baseline data that was developed through manual abstraction into spreadsheets will serve as an initial guide from raw data to data available. The clinicians and chart reviewers who have performed this abstraction will be interviewed to determine how they made their abstraction decision to replicate and document, where possible, their assumptions. The data will be extracted, transformed and loaded into the Azure environment and adequate space will need to be allocated for this effort with the ability to scale as more departments are brought online.

Scrum Development Process and Plan

Given our task is to develop a Data Warehouse for Hospital-wide use, we will be integrating data from many different sources. Each department will likely have its own way of capturing and storing data and generating reports, and so these departments will need to be consulted, their data analyzed, and finally processes will need to be implemented to make sure that data, when entered, is making its way to the Warehouse.

Since many departments will need to be worked with, it makes sense to break the work into phases, where phase 1 works with a subset of departments and involves the initial architecting of the Data Warehouse and data pipelines. Subsequent phases will incorporate more data from other departments, and limited changes will be made to the Data Warehouse. All phases will follow a Scrum or Agile development strategy, and so the work will be broken out into Sprints.



Resources

To start this project, we will need, at the very least, the following resources:

1. Network Admin - To act as Product Owner of the Data Warehouse and take point on governance issues
2. Data Engineer - To architect, implement, and own mechanisms for data entry and data pipelines.
3. Project Manager - To discuss requirements with each department and plan sprints.
4. Data Analyst - To work with the data from each department and act as a Developer for the project
5. Rolling / Ad-hoc SME's - As the project progresses, we will need to consult with different departments, and so having a department-specific SME to tap as a resource will be key to overcoming challenges related to that department's data.

Preparation for 1st Sprint

In preparation for our 1st Sprint, we should have decided the following points:

- ☐ Have we finalized the first batch of Departments to use in Phase 1 of the project? (*All*)
- ☐ Do we have all the necessary resources free for this Project? (*Project Manager*)
- ☐ Have all decisions related to technology been made? (*Network Admin*)
- ☐ Are any items still awaiting approval? (*Project Manager*)

Deployment

Once the 1st Sprint has been completed, departmental data has been included in the database, and the basic infrastructure of the Data Warehouse has been built, deployment of the artifact and additional features will be included into the following sprints. As the Data Warehouse is online and ready for use, there are a few clear directions on improving workflow and reporting structure, but there is great variety in choosing further applications for the Data Warehouse.

After the first deployment of the Data Warehouse, communication between departmental-specific SME's and the analytics team will allow for iterative improvement in workflows for data entry and data exports as well as necessary dashboards and reports (Deployment Model 1). There will also be room for analysts to begin developing models to predict the effect of treatment outcomes and create better roadmaps for patient care (Deployment Model 2).

Deployment Model 1

A Private Cloud Database available only to the hospital can provide dashboards and reports for variables of interest. Based on historical data of patients with similar conditions and medical history, these reports would be used to inform medical professionals of previous patients' roadmaps.

Deployment Model 2

A Hybrid Cloud Database that can access and share information from other medical providers can predict treatment outcome and patient care roadmaps with statistical significance. Other models to explore can include identifying patients outside the hospital who are at risk of specific conditions that should be referred to this specialized hospital.

Additional Deployment Applications

Within Azure, healthcare organizations are already leveraging the power of data. These 3 Azure applications are projects that can be explored and built into the deployment stages of sprints. 1) Rx.Health is an Azure Phone Application that focuses on patient engagement by monitoring patients, providing AI chat bots, and reminders for scheduling and prescriptions. 2) Microsoft Teams is used in tandem with Azure to focus on improved patient care. In HIPAA compliant chats, employees can share and access patient information in a more efficient manner. 3) Cosmos is an architecture that links point of care devices straight to Azure making data immediately available in the cloud. It cuts down on the resources needed for data entry.