

# Care provider unlocks actionable patient insights with Enterprise Data Platform QuickStart for Google Cloud

## Industry

Senior Care/Long-Term Care

## Location(s)

Canada

## Technologies

- EDP QuickStart for Google Cloud
- Google BigQuery
- Google Cloud Build
- Google Cloud Storage
- Microsoft Power BI

## Overview

A Canadian long-term care provider sought innovative, evidence-based care solutions to anticipate residents' needs. To help care workers rapidly identify residents in need of an intervention, the organization chose to analyze resident health data using sensors to capture data about its residents. It wanted to identify behavioral dynamics and trends, then train predictive machine learning models to anticipate the needs of its patients to deliver a higher standard of care.

**In just weeks, Pythian develops BigQuery data pipelines and custom dashboards to visualize critical healthcare data and provide proactive treatment.**

For more than 30 years, a prominent Canadian long-term care provider has improved the lives of seniors and their families across the continuum of care. It has a long legacy of continuous improvement and innovation in the retirement, assisted living, memory care, and long-term care industries. These evidence-based investments in its residents' safety, well-being, and quality of service enable more fulfilled and independent living.

In response to the COVID-19 pandemic, this care provider rapidly adopted an Internet of Things (IoT) care monitoring platform with wearable devices, sensors, and an analytics dashboard. These new data streams provided more accurate contact tracing, 24/7 facility monitoring, reporting, custom alerts, and non-invasive location tracking for staff, residents, and equipment—enabling effective risk mitigation within several facilities.

Encouraged by the success of its data-driven approach, the organization sought ways to be even more proactive against future threats by leveraging resident health data. It concluded that machine learning models could further hasten the shift from reactive to proactive resident care by analyzing behavior trends over time and detecting deviations. These health insights could help care teams better monitor resident health trends while enabling faster, more personalized care. Unfortunately, the IoT solution was not designed to scale and present aggregate data in ways that enabled analysis and predictive modeling. This posed some challenges for the internal analytics team.

### Business need

At the beginning of the COVID-19 pandemic, this long-term healthcare provider rapidly adopted a data-driven approach to risk management and resident safety. After seeing success with evidence-based strategies, it sought to leverage its investment in IoT technology and GPS data to derive behavioral insights. This would allow the organization to be more proactive and provide more personalized resident care.

When the vendor's platform limitations and a lack of internal technical experience presented challenges in aggregating data for analysis, it needed a technical solution and a partner to help it achieve its goal of deriving beneficial behavioral insights at scale.

Pythian's big data expertise and Enterprise Data Platform (EDP) QuickStart on Google Cloud helped the care provider design a solution that could deliver results quickly. Pythian's proprietary analytics solution enables BigQuery to BigQuery data ingestion, a visualization dashboard, and predictive capabilities that were previously unavailable to this provider. This approach makes 10 billion data points (and growing) available for analysis, fast-tracks the care provider's time to valuable behavioral insights, and lays the groundwork for more transformational projects in the cloud.

### Limitations of the existing solution and internal inexperience with Google Cloud hindered the client's ability to acquire proactive insights.

The care provider theorized that by analyzing behavioral insights and building robust machine learning models, it might be able to detect early health concerns in its residents. For example, a sudden change in the use of kitchen appliances or reduced sociability with other residents might indicate a new health concern. With one health record generated every three seconds, the staggering amount of resident GPS data might help detect where intervention was needed to provide better preventive care.

Despite this wealth of data, the organization faced a few challenges that prevented it from effectively accessing and analyzing its data in aggregate.

The care team uses a portal integrated with the IoT platform's Google BigQuery data warehouse to analyze and visualize resident health data. However, care teams could only export one health record at a time. This prevented the care provider from viewing larger data sets which would allow them to derive historical trends or build a foundation for future machine learning projects.

Additionally, the care provider did not have the internal expertise to design or build a platform capable of ingesting over 10 billion data points. When exploring other solutions, project quotes were well outside of the organization's budget and scope.

To help residents live more fulfilled, independent lives across the continuum of care, the care provider wanted to:

- **Overcome platform barriers to increase the availability of resident health data.** The care provider could only export one resident record at a time, which led to slow, tedious analysis.
- **Leverage custom data visualizations to enable resident insights.** The provider couldn't run the customized analyses it needed to unlock proactive care insights at scale.

### Solution/What We Did

In just a few weeks, Pythian deployed a customized Enterprise Data Platform (EDP) QuickStart for Google Cloud solution. The Pythian team delivered:

- A quick-to-value data in the cloud, analytics, and visualization use case supported by pre-project planning and infrastructure design
- A custom BigQuery to BigQuery data pipeline for greater health data transformation and utilization
- Custom dashboards providing descriptive visualizations that enable insights
- Post-implementation support and resources to empower end users

- **Lay the data groundwork for advanced analytics and machine learning models.** Developing scalable infrastructure would lay the foundation for machine learning models and advanced analytics.

### Pythian's analytics team delivered EDP QuickStart for Google Cloud to accelerate time to value and build a robust data platform to proactively manage resident healthcare.

In just weeks, Pythian successfully delivered:

- **A pre-project plan and use case to address data, analytics, and visualization needs.** Pythian helped the care provider clarify its ideal use case, then designed and built an Enterprise Data Platform (EDP) on Google Cloud.
- **BigQuery to BigQuery pipelines for data ingestion.** A newly implemented BigQuery instance now ingests data from the IoT platform's BigQuery warehouse, enabling greater data transformation and utilization.
- **A data visualization dashboard for predictive analytics.** The service provider created a data visualization dashboard built on Microsoft Power BI, enabling care teams to derive rapid resident health insights—at scale.
- **Post-implementation support and resources to empower end users.** 60-day support, knowledge transfer sessions, and infrastructure as code (IaC) allowed for a smooth customer handoff for continued insights and scalability.

The EDP solution's affordability, the promise of a short time to value, and Pythian's deep platform expertise convinced the care provider to move forward.

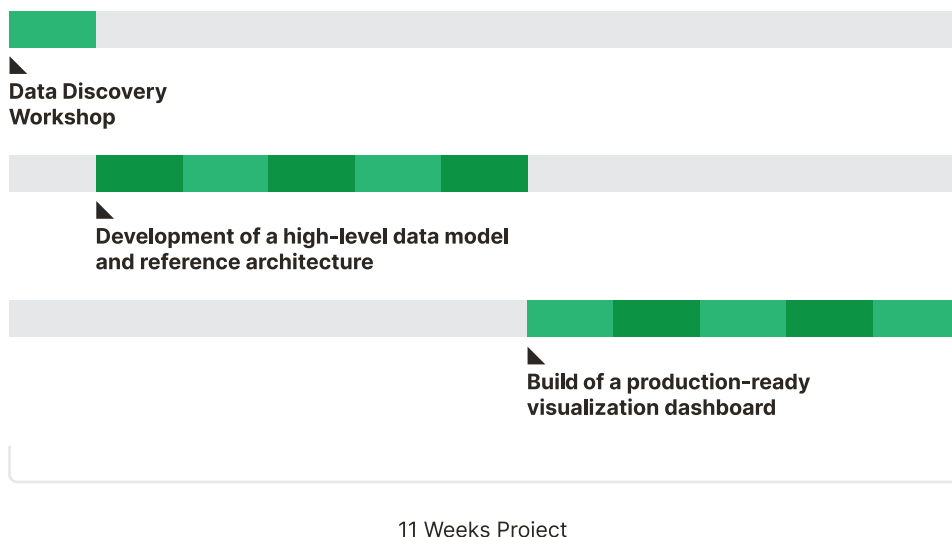
The eleven-week project began with a Data Discovery Workshop where Pythian's team of certified Google Cloud experts conducted an in-depth review of the care provider's data sources. After aligning with the care provider's analytics use case, Pythian developed a high-level data model and reference architecture. Through this process, the service provider's data and analytics team were able to highlight the transformational business value of the platform.

Pythian's implementation and custom dashboard plan included several key components: a new Google BigQuery instance, data pipelines, and customized dashboards for visualizing resident trends. The BigQuery instance ingests health data from the IoT vendor's BigQuery instance in near-real time, providing more access to the data that the insight team uses for analyses and reports.

### Result/Key Outcomes

Pythian's EDP Quickstart for Google Cloud gives the long-term care provider an affordable data analytics platform capable of transforming, warehousing, analyzing, and visualizing its residents' health records that include both structured and unstructured data from a variety of sources. This scalable foundation sets the groundwork for the organization, allowing it to derive actionable insights about the health and well-being of its patients, understand individual or population trends, and train machine learning models capable of anticipating when additional intervention might be needed.

Pythian built a production-ready visualization dashboard on Microsoft Power BI, the healthcare provider's preferred data analytics and visualization tool. Now, the organization's insights and care teams can study historical trends and perform analyses on an individual or multi-facility scale. This EDP allows the organization to fully access its growing warehouse of 10 billion data points, make proactive care decisions, and set the foundation for machine learning.



## The client can rapidly access resident health records, leveraging a scalable analytics architecture for personalized, proactive care

Now, the long-term care provider can:

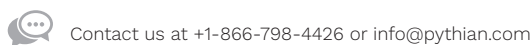
- Overcome vendor limitations and access billions of data points.** The care provider can now transform, analyze, and visualize resident health records in aggregate to visualize trends to improve care and foster independence.
- Access self-serve analytics and insights.** The organization's new BigQuery instance enables greater health data availability and transformation, while its Power BI delivers historical and near-real-time reporting with descriptive visualizations that aid in anticipatory resident care.
- Laid the groundwork for advanced analytics and machine learning.** This scalable architecture and enterprise platform approach enables advanced analytics and visualizations, and it opens up the opportunity to leverage machine learning models to proactively support at-risk residents.

Pythian's collaborative and transparent approach impressed the internal IT team. The team appreciated the willingness to answer questions, share information, and provide best practice recommendations. The EDP QuickStart on Google Cloud framework delivered several quick wins:

- Stakeholders saw how a cloud analytics pilot project could deliver value in just a few weeks.
- The internal team felt empowered with access to billions of health data points in a self-serve analytics platform with data visualization.

The internal insights and care teams can now use Pythian-created dashboards—and create their own—to quickly derive behavioral insights and share intuitive reports with stakeholders. These efficiencies will power evidence-based decision-making responsible for improving resident health and well-being.

Pythian's EDP is a foundation for future analytics systems and applications, capable of scaling to support machine learning. The care provider can easily add new IoT data sources to this platform in the future. The organization is ready to innovate across the continuum of care by building behavioral machine learning models to proactively manage resident care.



## ABOUT PYTHIAN

Founded in 1997, Pythian is a global IT services company that helps organizations transform how they compete and win by helping them turn data into valuable insights, predictions and products. From cloud automation to machine learning, Pythian designs, implements and supports customized solutions to the toughest data challenges.

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