

Global Media Company Revs up Subscriptions

Client

Global Media Company

Industry

Media

Technologies

Machine Learning (ML), Google tools, BigQuery, TensorFlow, Jupyter Notebooks

Business Need

The company had a vast repository of audience data, but struggled with converting viewers from casual browsers to paid customers.

They wanted to implement practices which were robust and flexible enough to expand across all their digital media titles.

While their internal Business Intelligence (BI) team knew an ML model was the answer, they looked to Pythian to provide expertise and guidance on the model's design and implementation.

Background

Mainstream media is highly competitive. With so many news and entertainment options, getting a consumer's attention—let alone his or her subscription fees—can be an uphill climb.

Pythian helped a global media company become more targeted and efficient at attracting subscribers by building a custom machine learning (ML) model and content recommendation engine.

Together, these powerful tools leverage the company's robust data to predict a website visitor's propensity to subscribe. With these insights, the publisher can now tailor future online content, marketing campaigns and special offers, all to convert more individuals from casual browsers to paid customers.

Challenge: Link on-page behavior to paid subscriptions

The media company needed to:

- **Make audience data actionable.** Visits to the publisher's online sites produced valuable data, but the company struggled to use the information to impact paid subscriptions.
- **Create a strong foundation.** The project began with a proof of concept (PoC) at a single regional publication, but needed the flexibility and muscle to expand across other digital media titles.

Challenge

The organization knew they could do more with their audience data, and they knew implementing machine learning could help, but they didn't have the resources to do it on their own. By building a custom ML model and content recommendation engine, Pythian enabled them to convert more individuals from casual browsers to paid customers by tailoring online content, marketing campaigns and special offers.

Solution

Pythian collaborated with the publisher to outline their strategy, then began data analysis and feature engineering, leveraging tools including BigQuery, TensorFlow and Jupyter Notebooks based on Pythian's familiarity with Google cloud services.

Pythian also employed Google services to build a custom content recommendation engine to give business stakeholders an on-demand way to test variables that would impact subscription rates.

The business is now well-equipped to optimize their marketing, operate more efficiently, and ultimately increase subscription revenue, using Pythian's custom ML model.

- **Tap expert resources.** The in-house business intelligence (BI) team wanted an outside perspective to expand their skills and ensure the project employed proven best practices.

The media company engaged consumers with a true multimedia approach, including print and online publications, podcasts and even branded apps. Their approach to data was just as sophisticated and professional as their online properties. An internal BI team was also in place to provide insights and reporting to stakeholders across the organization.

The vice president of BI knew they were leveraging only a small portion of the knowledge within their vast repository of audience data. Adding ML for predictive intelligence was the next logical step. The publisher tapped Pythian for a PoC, using audience data from one of their metro newspapers. The challenge was to determine a web visitor's propensity to purchase a paid subscription within 30 days. Having the answer would fuel a number of marketing decisions and incentive strategies—all tailored to the visitor's specific characteristics.

Solution: Apply smart thinking to ML and business problems

Working together, Pythian helped the company to:

- **Define the challenge correctly.** Pythian and the publisher collaborated to understand the business needs, then align the ML model to support those goals with easily digestible outputs.
- **Build a custom machine learning model.** The team leveraged several Google tools, including BigQuery, TensorFlow and Jupyter Notebooks, to analyze company data and predict each website visitor's likelihood of buying a subscription.
- **Create a content recommendation engine.** A separate custom solution leverages additional data to help the publisher match featured content, discounts and other special offers to each visitor's online behaviors and preferences.

While the internal BI team knew an ML model was the answer, they looked to Pythian for guidance on the model's design. Correctly defining the challenge was a cornerstone of the project. An important foundational step was framing the problem correctly for the ML model, while at the same time ensuring the model's outputs would align with the business use case.

Working collaboratively, Pythian and the publisher outlined their strategy. The ML model would use a time-series classification approach, then generate a numerical score of the "likelihood to subscribe" within

The Pythian Advantage

With Pythian's extensive knowledge of available services including Google cloud services, and applications and platforms such as TensorFlow and Jupyter Notebooks, the modeling the company needed was quick, easy, and affordable.

30 days of a visit. The business would digest this information to tailor content and marketing to various audience segments, such as those with high, low or medium scores.

Next, the Pythian team started data analysis and feature engineering and leveraged Google cloud services for the same. BigQuery provided data storage and organization; TensorFlow and Jupyter Notebooks made modeling a snap, allowing the team to experiment rapidly with various modeling techniques and eventually settle on a custom neural architecture.

Pythian also built a second solution, a custom content recommendation engine. This analytical tool, also created with Google services, gave business stakeholders an on-demand way to test different variables that would impact subscription rates (and company revenue).

For example, if a visitor viewed three sports articles, would viewing an opinion piece next make them more likely to subscribe compared to a local news story? Or, if a visitor completed the online crossword five days a week and also read food articles, would they be more likely to subscribe than non-crossword puzzlers who also preferred food articles? The recommendation engine could sift through immense amounts of data to provide user-friendly answers to questions like these.

Results: A framework for success across multiple news outlets

As a result of the PoC, the publisher is now equipped with:

- **Powerful subscriber insights.** There's no more guesswork for business leaders; data from the model provides solid direction for efficient marketing and increased sales.
- **Experienced resources.** With Pythian's collaborative and transparent approach, the publisher now has experts within easy reach and new skillsets for the internal BI team.
- **Clear direction for the future.** A successful PoC with the regional publisher creates a framework for increasing subscription revenue at the company's numerous other media outlets.

Moving Forward

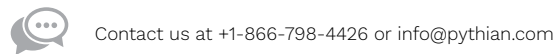
When the organization compared the results of Pythian's modeling to actual subscriber data, they found Pythian's information was highly accurate and usable. This gave them the confidence to move forward with plans to launch the model full-scale and expand it to other products across their portfolio.

The media company launched the PoC with two primary data inputs: visitor analytics from their newspaper's website and company data for recent subscribers. The ML model looked at on-page behaviors, such as patterns in the type of content viewed over time and frequency of visits. Using the custom neural network model created by Pythian, it created a "propensity to subscribe" score. The media company then compared this spread to actual subscriber data, finding highly accurate and usable information.

The positive results and Pythian's transparency at all stages of the project gave the BI team and the business stakeholders confidence in their approach. They plan to spend the next 100 days further refining the model, then launch it full-scale for the newspaper.

Once the newspaper's analytic program is off the ground, they look forward to expanding to other online publications in the media company's portfolio. Pythian provided a robust roadmap for ideal solution architecture and operationalizing their new tools.

The custom ML model arms the publisher with actionable information that will help them optimize their marketing, operate more efficiently, and ultimately, increase subscription revenue.



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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The Pythian logo is displayed in a large, bold font. To its right is a network diagram consisting of several purple dots connected by thin lines, representing a global network or data flow.