Roadrunner Analytics

*Roadrunner Analytics* is a young technology company specializing in the analytics of very large datasets, using techniques such as machine learning. It is currently headquartered in Blacksburg, Virginia. The company was created by a group of college friends who met when they were writing code for a college project. Who knew at the time that the early code would one day be the foundation for their flagship product, *Datarunner*? The firm is led by CEO Jordan Greene, who earned a management degree and is responsible for most of the business operations of the company. Knowing that he is managing a start-up, Jordan is always concerned about the firm’s future and is looking to secure some early clients to satisfy and encourage the firm’s angel investors. Although the investors recognize the promise of the firm’s technology, Jordan worries that *Roadrunner Analytics* will need a big sale soon to convince them that their money was well spent. Alexi Morgan was also one of the original college group members, and she now serves as CTO for *Roadrunner Analytics*. Alexi earned a computer science degree and oversees most of the technical development of *DataRunner*. A gifted developer, Alexi is passionate about her work and the new algorithms and techniques she develops to improve *Datarunner’s* performance. Mazi Kwame is one of the key employees, and one of the first outside hires made by *Roadrunner Analytics*. Mazi earned his degree in social psychology, and his role is to help the firm understand and incorporate demographic and sociological factors in their solutions. Mazi’s skill is in understanding and helping to design ways to monitor and reconcile social media and demographic data, which is integral to the promise of customized solution offerings. In addition to these members of the management team, *Roadrunner Analytics* has a small team of dedicated employees who are focused on understanding and delivering products to meet the needs of the data industry.

*Roadrunner*’s culture is professional, focused, and open. Management encourages open, constructive, and anonymous feedback from everyone working on its project teams. In a recent survey of organizational culture in young technology startups, Working Environment Magazine gave Roadrunner Analytics the top rating for its work environment. The company had the highest percentage of satisfied staff among all technology start-ups in the Mid-Atlantic region.
According to Jordan Greene, the founding values of respect and dignity toward all, and the emphasis on professional ethics, are responsible for high satisfaction levels among staff.

Roadrunner has an active outreach agenda, and participates in both national and international technology fairs. *Roadrunner Analytics* believes developing effective, customized solutions will help their firm develop trust and long-term business with clients. It considers a long-lasting relationship based on trust to be a source of business sustainability and competitive differentiation. *Roadrunner Analytics* plans to develop a diversified client base, varying from private businesses to more institutional clients like government departments and agencies. *Roadrunner* hopes that their public work will help contribute to a trustworthy reputation.

*Roadrunner Analytics* aims to differentiate itself through its flagship product, *DataRunner*. This tool is capable of integrating data from social media apps and other mobile apps, together with a retailer’s real-time data in their storefronts, to offer solutions that are easy to use. *DataRunner* incorporates gender, age, and other demographic data from user posts to make real-time forecasts that retailers can use to predict their sales. *DataRunner* is also location aware, ensuring that its forecasts are highly accurate and customized to each specific storefront. *DataRunner*’s main differentiator is speed: while many retailers analyze customer demographics ex-post, i.e., after sales are made, this real-time tool gives retailers the opportunity to act quickly and benefit from the insights immediately, i.e., ex-ante. *DataRunner* captures social media posts in real-time, and provides immediate detailed information to retailers. Applications range from predictive analytics, such as demand forecasting, to tools that drive targeted marketing efforts. Considering the real-time capabilities and versatility of the flagship product, business opportunities could be endless for *Roadrunner Analytics*, and while designed for use by retail industries at the outset, they intend to quickly expand from that base.

**Opportunities**

Recently, while participating in a business and technology fair in Shanghai, China, *Roadrunner Analytics* was approached by ZIPMART, a large retailer that is incorporated in Delaware but that also has a significant physical presence in Beijing, China. ZIPMART is a publicly traded company on the NYSE, has many retail locations in China, and is heavily invested in online global sales in many countries. It is presently interested in developing a better
understanding of daily customer traffic. After hearing about DataRunner, Zipmart offered to supply Roadrunner Analytics with a large dataset of purchasing records to use in training its software, but only if they can reach an agreement. As a major retailer, ZIPMART has tens of millions of records in its databases, including both transactions at its retail brick-and-mortar stores and records of purchases that customers make online via its website. ZIPMART hopes to use DataRunner to understand the purchasing behavior of existing customers, forecast and plan for future demand, potentially target new customers, and even improve the layout of its stores and websites. According to ZIPMART’s CEO, Chris Wang, who met with Roadrunner’s Jordan at the business fair, “We want to use big data analytics to improve our balance sheet, pay higher dividends to our shareholders and keep up our reputation for aggressive growth with increasing profits every quarter.” Jordan concurred with Chris about the possibilities, and agreed to meet at ZIPMART’s office for further exploration of this business opportunity.

At the meeting between Chris and Jordan, many of the discussions about ZIPMART and Roadrunner Analytics focused on which specific attributes would be captured in the database that ZIPMART offered to share with Roadrunner Analytics. ZIPMART proposed to retain certain individual characteristics of each transaction in the database to meet its targeted marketing aims, including: timestamp of the purchase, location of the purchase, list of items purchased, purchase prices, and basic demographic data, such as gender, age, and other basic factors. ZIPMART listed the following objectives for Roadrunner Analytics’ use of these data attributes:

- Create tailored and effective sales and promotional plans for its retail customers.
- Forecast supply needs to ensure that it is stocked to meet demand in a focused way.
- Design effective targeted marketing strategies to reach individual consumers.
- Design retail stores based on customer shopping habits.

When Jordan reports back to the staff at Roadrunner Analytics, there is excitement about the potential of this new project, as working with such a major client could open doors for future work. As a start-up, Jordan believes building these major connections is paramount to establishing their brand in the competitive analytics market. However, there are some side discussions about concerns with the proposed project and how the analytic techniques used might impact consumers.
Meanwhile, Roadrunner received news that they were on the short list for a different project in China, one that Jordan thinks might just be a good fit with the Zipmart work. This second project involves a number of government agencies, including the Municipality of Beijing. Jordan, Mazi, and Alexi go to dinner to discuss this new development.

After ordering dinner, Jordan explains the background of the potential project. Beijing is part of the Beijing-Tianjin-Hebei urban cluster, and very frequently faces bouts of smog.1 Government officials in Beijing are concerned about not meeting the clean air targets finalized in the 2013 State Council document.2 If the air quality is not drastically improved in the near future, it might affect the construction industry in Beijing. The construction industry has been a leading factor in the economic rise of China in the last few decades, helping to keep GDP growth above 6.5%. The Ministry of Environmental Protection of the People’s Republic of China, Ministry of Public Security, and the Government of Beijing Municipality, have decided to collaborate in order to tackle this growing air pollution in Beijing. The Government of Beijing Municipality was given the direct responsibility to identify ways to improve air quality, maintain economic growth in the urban cluster, and to make the region more competitive for local, national, and international businesses. Under this directive, the Government of Beijing Municipality launched an international announcement that they intend to contract with a consortia of firms to design efficient ways of managing air pollution and improving the deteriorating perception of Beijing as a favorable business destination among national and international businesses. This consortium will have a maximum of three companies or organizations, one company or organization with deep social ties in Beijing, one company or organization with expertise in construction management and environmental sustainability, and one analytics company.

Roadrunner Analytics is on the short list of analytics contractors to possibly be part of the consortium. Although it is a young firm with no international business experience, the advanced capabilities of its product DataRunner spurred great interest in the Ministry of Environmental Protection of the People’s Republic of China, Ministry of Public Security, and the Government of Beijing Municipality. Jordan explains that Roadrunner Analytics has scheduled meetings with the Government of Beijing Municipality to enter into negotiations.

2 http://www.cleanairchina.org/file/loadFile/27.html
All three government agencies have agreed to supply Roadrunner Analytics, and other selected analytics companies, extensive databases containing data about individuals and local businesses. The entities must sign an agreement to provide a proof of concept (POC) if they are given access to the data. With the predictive capabilities of the Datarunner solution, the goal is to train it on the data to do things like identify future spikes in pollution, engage in changing traffic patterns, and to alter the production at certain facilities. The application of Datarunner would be much like that of data analytics in smart city technologies that are used around the world. According to several unofficial accounts, details in the database of Ministry of Public Security cover extensive accounts of individual characteristics, such as eye color, height, race, most common hair style, restaurant eating patterns, preferences for tea or coffee, travel history, criminal records, general purchasing history starting from first year of employment, medical records, family histories, and education backgrounds. While most of this information can be found in a variety of open sources, the government’s database is the only place where all of the information has been aggregated. Jordan wonders if they meant to restrict use of the database beyond creating a proof of concept, but he sees no such clause in the agreement that he signed on behalf of Roadrunner.

During their dinner discussions, Mazi expressed doubts about getting involved with government surveillance and its possible effect on individual rights. But Alexi was excited about how the two projects aligned --- the additional data from this project could be used to test and improve Datarunner’s customization for ZIPMART. Jordan silently considers if ZIPMART should be informed about use of data from the other project.

**Back in Blacksburg**

After the trip to Shanghai, the Roadrunner staff and project team gathered together to discuss the possible two projects, starting with Zipmart. Some members of the team voiced concerns that the Zipmart detailed dataset could permit individual customers to be personally identified. Mazi mentioned that, from his background in social psychology, he expected that purchasing histories would be unique and could be traced back to specific individuals. He seemed to remember an interesting study that found that most people in the United States can be uniquely identified with limited information about their gender, date of birth and zip code. These
attributes sounded eerily like the location of purchase, gender, and age captured by ZIPMART’s dataset. Additionally, the staff at the meetings expresses concern that repeated entries for each purchase would add to the ease of identifying individual customers.

Alexi is particularly concerned about taking custody of the entire dataset. The data is of high value because of all the detailed information, making it a prime target for hackers. And how would Roadrunner know, in any case, if all the data and the algorithmic insights were used for other, more intrusive purposes?

The team discusses the Chinese smog project next. Xiao Xu, a data analyst who has been quiet up until now, speaks up. “My extended family is from China, so I’ve heard about a new citizen rating system that is planned by the government of the People’s Republic of China. Reportedly it will use data and algorithms to create a social credit rating system by 2020, to rate all citizens and give them a trust score. A pilot program for testing social credit ratings system was launched in 2014. This makes me wonder if our work might be fed into this project in the future; and, what would this mean?”

**Final discussion**

Jordan, Alexi, and Mazi decide to charge a group from the staff [your team], to study the two pending projects and analyze the opportunities, ethics, and potential risks of the decisions. They ask the group to recommend how, or whether, to proceed with these projects. Your team is asked to explain the reasons for the recommendations carefully because they may be used to construct criteria for making project decisions in the future.

*(Please read the case competition rules and the judging rubric for requirements and expectations about the analysis.)*