CEOCFO Magazine

ceocfointerviews.com

Issue: December 4, 2017

# Q&A with Berardino E. Baratta, CEO of Potentia Analytics, Inc. a leading provider of advanced workforce and workflow optimization solutions for healthcare including Intelligent Provider Scheduling, ER Patient Flow Optimization and a Policy and Decision-making module.

**Berardino E. Baratta**
**Chief Executive Officer**

**Potentia Analytics, Inc.**
**www.potentiaco.com**

**Contact:**
**Tavia Vasicek**
**618-505-2001 ext 105**
**info@potentiaco.com**

**Interview conducted by:**
**Lynn Fosse, Senior Editor**
**CEOCFO Magazine**

**"We've always had the mentality that every effort, no matter the size, is worth it if it solves a real problem. When Envision first started using Symphony, we were one of many different scheduling solutions they used. We worked hard to win every one of their sites by solving the real scheduling problems each site faced. This has given us a rich baseline set of features and the attitude that we're here to solve our customers' problems."- Berardino E. Baratta**

**CEOCFO:** ***Mr. Baratta, according to your site Potentia Analytics Inc. is a leading provider of intelligent healthcare software. How so?***
**Mr. Baratta:** Potentia Analytics was founded in 2013, originally as R&B Soft, by a computer scientist, Dr. Shahram Rahimi, who is currently Chair of the Department of Computer Science at Southern Illinois University in Carbondale, IL and a medical doctor, Dr. Sean Bozorgzadeh who is currently the site medical director for the Emergency Department at Peace Health / United General Hospital in Sedro-Woolley, WA. Shahram is a computer scientist with a passion for healthcare and Sean is a doctor with a passion for computer science. They started looking at how to shorten the time for new technology to go from academia into the mainstream market with a focus on healthcare as they saw the massive transition beginning to happen with respect to both technology in healthcare and how healthcare service is provided. The old way of providing healthcare is just not there anymore. It is becoming more of a service industry. Technology is quickly changing how doctors and nurses manage patient care; it is allowing them access to information in real-time that they never could consider in the past. So, Sean and Shahram got together and started this company with the idea of, "Let's apply the latest computer science technologies to solve healthcare's problems." Initially they played with many advanced ideas but the first complete product was focused on optimizing the process of scheduling doctors for Emergency Departments. Experts are predicting that within the next 20 years, there will be a gap or shortage of fifty to one hundred thousand doctors! Given this upcoming shortage, attracting and retaining doctors will be key and that starts with how you schedule them.

**CEOCFO:** ***What did they come up with? What is the product or service?***
**Mr. Baratta:** Symphony: Intelligent Provider Scheduling. Symphony provides automatic scheduling with fairness optimization, open shift

management, analytics and reporting, credential tracking with alerts and time and attendance with geolocation support in an easy to use, cloud based solution. Most scheduling today is done through a lot of human effort, manually picking which provider goes into which shift, followed by a lot of phone calls to close any remaining “open” shifts. For example, I am trying to schedule my Emergency Department for December. I have my list of doctors and I know that Dr. Smith prefers to work mornings and Dr. Jacobs prefers to work nights and Dr. Jones prefers weekends and Dr. Williams needs two days off for a family event and so on; and they start moving them into the schedule trying to appease everyone’s requests. Then they must fill the shifts that nobody wants; the evening shift on a Friday night, the overnight shifts, New Year’s Eve, Christmas, the 4th of July and things like that. In the past, they would offer incentive bonuses, basically bribes, to get a doctor to take a shift! “I know that Dr. Smith would really like to pick up an extra shift. Let me call her and I’ll offer her five hundred dollars to take this shift on top of her normal pay.” However, human beings are human beings and what they often do is offer the maximum amount up front to the person most likely to accept the shift in order to fill the shift as soon as possible so that they can move on to the next shift needing filling. This old method is very expensive both in terms of time and money. With Symphony, we focused on improving schedule building and open shift management. Our automatic scheduling tool was one of the first available and replaced the manual work of assigning people to shifts including considering personal preferences: what days they can’t work, do they prefer days or nights, weekdays or weekends. In addition, it incorporates business and contractual rules: how many shifts are they obligated to work, how many nights, how many weekends, etc. Finally, it incorporates fairness and niceness rules: managing circadian rhythm, limiting days worked in a row, and others. Many tools now incorporate automatic scheduling, but they use a brute force approach. Our algorithm uses Monte Carlo simulation as well as other advanced techniques to create hundreds of possible schedules and analyzes each possibility to compute a score based on how well that schedule meets the provider preferences, business and fairness rules. In just minutes it will provide the scheduler with the best possible schedule for their given situation. This first piece can save hours of manual effort per schedule per month. The second innovative feature, our Open Shift Management toolset, is something that no one else has. We made it easier for schedulers to communicate with the doctors through messaging, sending emails and things like that, but that is not the innovative part. As I said before, in the past a scheduler would have to make many phone calls to fill open shifts so would often first call the doctors they knew were most likely to pick up extra shifts for increased compensation. That model allows schedulers to close their shifts quickly but leads to ever increasing amounts of incentive pay. At one major physician staffing group, incentive pay has increased 100-fold over the last 20 years! To fix this, we decided to completely change the model. Our Automated Offers feature makes offers to multiple providers at once with the ability to control when offers will be made and for how much. I might offer the shift for nothing initially, then a few days later offer it again with a little bit of a bonus. The next offer’s bonus might go up or it might go down. You decide how early you want to start offering incentives; some hospitals start making offers months ahead of time, others wait until 4-6 weeks before the start of the shift. The Automated Offers tool provides schedulers and management complete control over the process including approvals. At one hospital, using our product, thirty-three percent of open shifts were picked up by doctors with no

incentive, because the doctor just wanted to take another shift, for instance, “Our family is going on vacation next month and I could use a little more money,” or “I am single and will work Christmas Eve to help out my colleagues who have family.” In other cases, the shift was picked up quickly by someone that was low on the totem pole and who would traditionally be one of the last people getting a call. Our tool levels the playing field by sending offers to all the doctors at once avoiding any favoritism. The first person to say yes gets the shift. When used fully, the tool can reduce incentive bonus payouts by up to fifty percent, and closes the schedule with very little effort by the scheduler. Some scheduling managers would say, “But then my schedulers will lose their personal connections with our providers.” The opposite is true; schedulers can spend more time with their doctors building relationship. Doctors like to be taken care of and shown appreciation. Schedulers can now spend time with their doctors building relationship: making sure that their needs are being met; making them feel special. Whereas in the past, much of the time when a scheduler would call them, it was to try to convince them to take a shift or the doctor would be calling the scheduler when they were mad about the fact that they had asked for Friday off and they did not get it and why did they not get it! Symphony gives you the best of both worlds: save money and build better relationships.

**CEOCFO:** ***What is the third module that Symphony offers?***
**Mr. Baratta:** Symphony offers many modules, but probably the other piece that is most interesting compared to our competition is our analytics and reporting tool. Today, companies like Envision Healthcare’s Envision Physician Services, who are the largest provider of outsourced physician management in the country staffing Emergency Departments as well as other hospital departments, spend much of their budget on people related costs. They have diverse sites across the nation with different business practices, compensation rules, contractual requirements, etc. Their leadership relies heavily on reports to be able to manage the one million plus staff hours scheduled each month. Schedulers spend a significant number of hours each month just creating reports, which is often a manual process leaving a lot of room for human error. To improve this, we created a very simple yet powerful set of reporting tools that give the schedulers complete flexibility over report generation. Our competitors tend to have a fixed set of reports: report A and report B; if report A does not fit your needs and report B does not fit your needs, if you’re lucky you might be able to get what you need by downloading both reports into Microsoft Excel and merging the two to create the actual report you need. We have a tool that allows you to do custom analysis of all your data and present it the way you want! With drag and drop ease, you can choose all the data points to include in the report, how you want to filter the final data set, and in what format you want to present the final report. Schedulers have told us that it is a life saver, allowing them to quickly create exactly the report they needed without having to spend hours in Excel. They can do it all inside of Symphony and generate the final report as a PDF and you are done!

**CEOCFO:** ***Who is using Symphony? What types of providers and how do you gain attention from the various parties that might want to be involved?***
**Mr. Baratta:** Today we are used to schedule providers at over seven hundred and fifty hospitals in 49 US states, with committed expansion to over 900 locations by early next year. Approximately eight thousand providers are scheduled every month, representing over one million shift

hours. That includes ER doctors, specialists within the hospital, advanced practitioners, nurses and scribes. We are not the biggest, we are not the smallest; but we are in the upper range. Even though we serve such a large number of providers, we are still very much a small company. We grew with mid-western mentality where you do not grow faster than you can afford to grow. When the company was started, the focus was very much on its first customer, EmCare, which through a merger became Envision Physician Services. Our founders did not put any attention into growing beyond EmCare/Envision, because Envision was large enough that they felt "This needs all of our attention right now." After over three years of serving Envision's needs, we are in the process of expanding Symphony beyond Envision. We're very lucky to have had Envision as our lead partner. Normally a single customer company finds it very hard to grow beyond their initial customer because they built a product that is so specialized making it hard for anyone else to use it. The benefit of working with someone as diverse as Envision is that with so many different client hospitals across the nation; they have so many different styles of how they handle each hospital and how they handle providers. They forced us to build a product that is flexible enough to be able to handle their diverse needs from small, rural hospitals up to major metropolitan centers yet robust enough to support their over 22,000 providers. Most of our better-known competitors have never dealt with customers the size of Envision. We have created a product that is as flexible and scalable as the best in the industry, but few people know who we are! As we go to market, the first thing we have to do is tell people who we are. Six months ago, the company did not have a marketing person, because they felt they did not need marketing. They had their customer, they were happy with their customer and so "Why do we need marketing." When I joined earlier this year one of the first things I did was start having the founders' and the general company mentality shift from, "We serve Envision's needs" to "We serve the market's needs." This mentality shift wasn't easy! In talking to a large potential client who is looking to switch away from a well-known, major scheduling solution, our team was surprised that we were able to go toe-to-toe with somebody that big! The customer was surprised at all the features we offered, including solutions to problems that their current scheduling software couldn't handle. The reality though is that our competitor was asked to implement a solution but told the customer, "You're too small, it's not worth the effort." This customer has more than 20,000 employees being scheduled every month, but were deemed "too small!" We've always had the mentality that every effort, no matter the size, is worth it if it solves a real problem. When Envision first started using Symphony, we were one of many different scheduling solutions they used. We worked hard to win every one of their sites by solving the real scheduling problems each site faced. This has given us a rich baseline set of features and the attitude that we're here to solve our customers' problems.

**CEOCFO:** ***Do you have other products as well?***
**Mr. Baratta:** Yes, we have two new products that are interesting. The first, Bernoulli, is very innovative and in trials at US hospitals right now. Bernoulli optimizes patient flow through an Emergency Department (ED). The challenge in an emergency department is that you do not know when your patients will show up nor how sick they'll be. However, you must schedule enough doctors, nurses and other staff to take care of what you hope is the average number of patients of average level of sickness. If you are overstaffed, then you can handle the emergencies

that might happen; many more patients or a few very sick patients. However, if they do not show up you are spending money with no benefit. If you under staffed you have the risk of stressing out your doctors, nurses and other staff, which creates tension and increased risk of errors because they are overworked. With the changes going on today with MACRA and MIPS, it is also a money issue in that if patients are unhappy or your wait times are too long or your left before being seen is too high, you will get reduced payments from Medicare/Medicaid vs. other hospitals that have better metrics. Going back to the shortage of doctors and nurses that I mentioned before, a department that overworks their staff will have a hard time attracting and retaining these highly desirable healthcare providers. Getting your staffing right is the solution to many healthcare problems. Bernoulli uses advanced simulation and flow optimization techniques originally developed for factories and the service industry. Using historical data as well as an ED flow model, Bernoulli creates the perfect schedule to meet each individual ED's needs. Hospital leadership can also use the tool to play with "what if" scenarios. What if we extended our fast track by 1 hour; What if we brought in an Advanced Practice Provider for 6 hours during our busiest times. They can play with each what if and Bernoulli will predict the change to their ED's performance such as length of stay, wait times and left without being seen. As a nice bonus, the same simulation and modeling engine can continuously look at the last 24 hours of patient inflows to provide a real time early warning system for potential bottlenecks. It can warn you that in three hours the lab is going to get swamped with ED patients, while your nursing staff will be underutilized. Therefore, you can choose to solve the problem by having a nurse draw blood to reduce delays. "We have an influx of patients that are all going to need blood work. We'll draw blood here in the ED to reduce the strain on your department." This creates an opportunity for increased communication between departments and joint problem solving. The tool can also be used to simply predict the best time for a nurse to take their break, often times, they don't have a formally scheduled break time, with Bernoulli it can tell you that for the next hour there are no discharges, admits or transfers expected so it's a good time for a nurse to take their lunch break. A tool like Bernoulli is common practice in many markets (restaurants, amusement parks, manufacturing and others) but this is one of the first implementations specifically for the healthcare field.

**CEOCFO:** ***What is your third product?***

**Mr. Baratta:** The third one is called PotentiaGT, and although the core algorithms are completed and trialed in the real-world, we have not fully commercialized it yet. PotentiaGT uses machine learning, AI and Game Theory to help improve decision making. If you remember the movie "A Beautiful Mind", it was about a real person named Dr. John Nash. Dr. Nash was a brilliant man who took an advanced mathematical concept called Game Theory and applied it to economics. Game Theory is, simply put, a simulation of players playing a game to predict an outcome. By defining various attributes for each player, it's amazing how well Game Theory can be used to predict real issues. PotentiaGT builds upon the work of Dr. Bruce Bueno de Mesquita who applied Game Theory to policy decision making. Dr. de Mesquita noted that our implementation is more accurate and less error prone than any other version in existence today but like all implementations of Game Theory, it is highly sensitive to input correctness. To help users choose the correct input values, we have augmented the core algorithm with a tool to automatically generate the list of possible players for a given subject. We use GDELT, which is a

public database of structured data pulled from globally published news articles. Based on inputs from the end user; the topic question and the primary opposing players; the most for and most against, we mine GDELT to find all possible players and use sentiment analysis and other techniques to determine each player's starting position, how influential that player is and how important the topic is to that player. We can supplement the GDELT data with our Twitter analysis tool that will analyze tweets from key influencers along with hashtags sentiment analysis to include popular opinion on the topic. For example, if you asked about possible outcomes of NAFTA negotiations, with USA and México as the main players; the tool would suggest Canada, various unions, Asian and European trade entities and others as players including initial inputs. For the Affordable Care Act, with Republicans and Democrats as the main players; the tool would suggest the President, insurance companies, lobbyists and others as players. PotentiaGT was used successfully last year to strengthen two decisions included in Saudi Arabia's Vision 2030 initiative: the removal of gasoline subsidies and the expansion of Umrah pilgrimage. The reason we haven't fully commercialized it yet is that it's not yet ready for just anybody to ask a question about any topic and expect a meaningful response. Subject Matter Experts are needed to be able to review, adjust and/or augment the initial list of players and input values generated. Once you ensure the best accuracy in your starting assumptions, you let the PotentiaGT engine play some games! The Subject Matter Experts can then interpret the results including what offers each player made and received along with how coalitions were formed and disbanded through the multiple rounds leading to the final outcome. Nothing can ever be 100% right all the time; Decision making is not an exact science. If you guess, you have a 50% chance of being right. An expert might be right 60% of the time; a group of the best experts might be right 65-75% of the time. With PotentiaGT using a standard test methodology endorsed by Dr. Buena de Mesquita, we were right at or above the level of the best groups of leading experts but with a smaller margin of error. Simply put, PotentiaGT allows your in-house experts to make decisions with the same level of confidence as the leading consulting houses.

**CEOCFO: Is there anything else you would like to say about Potentia Analytics?**

**Mr. Baratta:** We're a company that has quietly built some leading technology for healthcare and other markets. With our connection to leading University research, we strive to accelerate technology innovation in the commercial market to solve real-world issues for our customers. Right now, Healthcare is undergoing a sea change with respect to service, technology and oversight, which is both exciting and scary for those involved! Through my personal experience, with startups and large Fortune 500 companies, the most successful companies are the ones that are nimble and can adapt to change. That means you have to act small but think big. That is what we are trying to do, and we're excited to help our customers change people's lives!