

Machine Learning and the Evolution of Employee Benefits



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CEOCFO: *Mr. Burt, what is the concept behind Data245?*

Mr. Burt: Good afternoon and thanks for reaching out. Wow, I have got to tell you that I have been in the insurance employee benefit field for nearly thirty years. There is really nothing that has been new in terms of technology. Back in 1999 I came up with a program for enrolling employees online. We called it **benefits talk** or online enrollment. Today it is de facto. Everyone has an online enrollment system. We pride ourselves on thinking about the future and where the future of employee benefits is going. To that extent, three years ago I was diagnosed with Stage 4 cancer and that is a wakeup call. First of all, I thought I was too young.

Second of all; it could not happen to me. However, while I was rehabbing; and thankfully I am very healthy today, beating the odds, I started thinking about WL, which was my previous company, and thought "How did we make WL successful? The answer to that question was in bringing a new technology to the marketplace. That morning, at two forty-five AM, I started thinking about data and the power of data and that is where the name Data245 came from. I started to wonder what we could do with paid claims data for good sized groups that would predict the future. I wanted to know what the budget was in the year 2020, 2021 and 2022. I wanted to know what the large claims would be. I wanted to know what the upcoming trends were, claims that we had not even put on our radar yet. I will get into that in a minute. I realized that machine learning is the one way that we can predict these outcomes and protect our groups from claims that they have not yet experienced and how we can better health insurance plans for all Americans, basically.

CEOCFO: *What have you developed so far?*

Mr. Burt: We have spent the last eighteen months basically preparing the company for a launch, because although you have a great goal, you have to build the algorithms and they are very specific. For example, we have five buckets. One is mental health. What falls into mental health - how do we predict it early, how do we treat it and what are the future solutions or treatments. The next one is morbidity; the general morbidity of the group, what conditions have we not identified that could hurt us in the future. Then, there is mortality of our people.

We know that people are not living as long as they used to. There is an anomaly in our data right now that over the last eighteen months we are seeing that millennials are getting sicker quicker and that is sort of a phrase that we put together on that. That is because we are seeing serious health conditions in groups of between thirty and forty years of age, that are serious; many more cancers than we expected, mental and nervous or mental health issues are really at an epidemic level, in my opinion. For example, employees that take an SSRI for depression or anxiety are three times more expensive to a health plan than those employees who do not take pills. The question is, you do not just ask an employee, "Are you treating depression." You find that out in the data.

Then there is the prescription drug category, which is use and abuse over prescription opioid addictions and things like that. There is a tone of information in the prescription drug data. We mine that very heavily. Then, we merge medical and prescription together and validate our outcomes. Therefore, there are a variety of different categories that we look at, specifically for future conditions.

CEOCFO: *Where do extraneous events come in, such as a Chernobyl or a pandemic?*

Mr. Burt: It is specific to each group as we do our algorithms. An algorithm for even one report could take two months to build. You are really just dealing with algebra, linear algebra and calculus. That is really what it is. Then you teach the computer to learn off the patterns; its own patterns and the patterns it develops from the data you provide. You have to provide a lot of data. However, an anomaly like that is hard to predict in the future. However, for example, diabetes; we do have a report for pre-diabetics in the group.

We have found that in some groups there is sixty percent of the group that is subject to a pre-diabetic condition. Remember, there is HIPAA, so we cannot share a lot of this information in detail with the employer group on a one on one basis, but we can provide aggregate reporting. That is what the algorithm does. However, pre-diabetes could affect six in ten employees in a group today and diabetes is a killer, quite naturally, if not treated or diagnosed soon enough. Therefore, these reports are very important to not only affiliate a group with a care provider, be that a remote care provider; we call those "centers of excellence." We just did that for a group here in Chicago. They had about sixteen hundred employees and we found that the propensity for cancer in this young group was much larger than a number of other groups who are national statistics. She saw the same thing in her previous data and, of course, was very concerned.

We then suggested perhaps DNA testing, on a voluntary basis; in the group would be appropriate. If there is a fear of cancer in the group, especially among young people, DNA testing would tell you the markers that exist and if you have them. The one way to cure cancer; and I should know because I did not get to it soon enough, was appropriate and proper preventative maintenance. Go to the doctor often, ask for cancer testing, testing on the blood and so on. Many of us do not do that until it is too late. Others are more proactive because perhaps their mother or father or sibling has cancer. We are trying to elevate the regiment of maintenance at annual physical to include cancer screening.

CEOCFO: *People do not stay in jobs forever the way they used to. How interested are employers, given that they may not have to worry about these problems in the future, for their current employees?*

Mr. Burt: The data indicates that there are similarities in all millennials, no matter who you hire. That is because we all are subjected to the same food, the same water and the same sugars in our diet and so on. There is a thin line there of similarity amongst them, because you do not just find cancer in one group and not find it in another as an anomaly, especially the larger the group. The larger the group, the more competent and the more credible that data is. If you have twenty percent attrition a year, our data algorithms account for that. We do know there is turnover, we do ask that question and because we get sensitive information from the group for three or four years, we can see that fluctuation. Therefore, we have built that into the algorithm.

CEOCFO: *I am guessing virtually every company could benefit, but do you see certain industries, types or sizes of companies that are likely to be more interested?*

Mr. Burt: You know, that is a good question. The larger the group, the more interested they are in our technology. Healthcare, hospitals and hospital systems have been very interested, because many folks that work in a hospital tend to be more aware of morbidity. If you think about it, they are exposed to morbidity and mortality every day. They tend to believe that every time they cough, they have cancer. In healthcare, they do have a larger claim cost per annual basis than non-hospitals. It is one of the anomalies in hospitals that they are larger claimants and have higher losses than any other industry.

There is a real interest there. I think the chasm is that there are very few people in hospitals that are scientifically thinking, that are thinking more on a machine learning basis. They may have heard of artificial intelligence but have not yet taught themselves. Therefore, what we find ourselves with hospitals is that we are currently running education classes. We are teaching them what it is. We have a demonstration or a webinar. We teach them what machine learning is and try to get them comfortable. Then, we ask if we should take a look at a slice of their data and recommend something. We do offer a free report to any client that is interested on one algorithm to show them the benefits of machine learning. It is really remarkable.

CEOCFO: *What do you find are some of the bigger misconceptions about machine learning?*

Mr. Burt: That we are going to replace humans. I think that healthcare is one of the last places we will ever replace a human being! However, the ability to foresee future claims is critical. I have interviewed a number of CEOs here in the Chicago area, all representing companies that are over one billion dollars in revenue and many of them are personal friends that were easy to approach. I said, "What would the value be of understanding what your budget would look like for healthcare expense, employee benefit expense, into the future." One of the gentlemen said, "Paul, we buy metal to make our product. If I could see where metal prices would be in three years, I could build an unbeatable business model and I would be able to circle the market." He said, "So, if you could predict the expense of medical expense, employee benefits expense and benefits for all of my employees, I can start modeling around that and make us a more profitable business." It is not a message, Lynn, that you can tell a VP at HR. Not that you cannot, but it is more difficult. Their job is to oversee the human capital. We need to be speaking to the CFO who is looking at three years down the road and the cost of running a hospital, the slim margins that they have and the impact of legislation. This information would be very important to them!

CEOCFO: *There are so many new advances in medicine. How can you account for some of the changes over time on what might be available or what might not be available to add to the mix?*

Mr. Burt: I will give you a good example. Last year, if you had told me that there would be a prescription drug treatment, which is gene therapy, that costs two point one million dollars per treatment, I would have laughed! However, that is what Novartis has announced at the beginning of this year and at the end of last year; that there is a gene therapy treatment that is now FDA approved, that cures a problem, primarily in children, but it is two point one million dollars. The industry is forcing us to see much larger expenses in our prescription drug plan than ever before! I thought my chemo, as I was taking chemo pills daily, at fifteen thousand dollars a month, was extravagant! Can you imagine two point one million dollars?

Then, there is another firm that came out with one that is not yet approved in the United States that is one point eight million dollars and last week we just heard about one treatment, not for the same condition, but a similar gene therapy treatment, that is eight hundred and fifty thousand dollars. Now, it is one treatment and the treatment cures the problem, which is remarkable! However, could you imagine how we could bankrupt our American healthcare system if we suddenly had a cure for cancer and each treatment was one million dollars? There would not be enough money around! That is the pace at which we are advancing our prescription drugs. The opioid addiction notwithstanding, if there were something that attractive everybody would do it. We know that United Healthcare has paid, I think, a dozen of these claims already this year. You would not think there were that many people, but there are! That is not talking about BlueCross or Cigna or any of the others. However, you have got to imagine that every insurance carrier is being exposed to these unbelievably expensive drugs, and this is just the beginning! That is why machine learning is critical.

If we suspect there are any of these gene therapy type expenses in the group, we need to identify this in order to adjust their reading charts on the group. We would have to amend plan designs. You are never going to collect enough copayments or out of pocket to cover that, quite naturally. That kind of expense would bankrupt any employee in this economy. When you ask about things that are changing, not only is machine learning and data science changing at a blisteringly fast pace and we keep up with that, but now we are learning that new healthcare is morphing into sort of an "Outer Limits" type of feeling, where two point one million dollars and it cures it; what insurance company is going to decline that. In fact, United Healthcare tried. They declined the first claim early in the year in the first quarter and there was so much political pressure and so much public backlash, that they rescinded it and now approved them all. Imagine if there were ten of them in the first quarter of the year. That is twenty million dollars! You know that United Healthcare is not going to eat that money. They are going to pass it on in rate increases to their groups. Therefore, we have a real problem now in the economy with these gene therapy drugs. It is a wonderful technology, but it is very expensive!

CEOCFO: *What has changed in your approach since you started? What have you learned as you have been building your system and your algorithms and even your approach to potential users?*

Mr. Burt: Thank you for asking. Initially, we thought that the HR department, the VP, the managers; they would be interested in this. You may have stumbled upon it earlier when you said, "What is the relevance, and should it really matter to them." It was not until a few months in of our selling practice that we said, "Well, the Chief Financial Officer is interested in this information, not the VP of HR," because ultimately, they always operate in hospitals in at least a three to five-year budget scenario. For him or her to take that category of employee benefits expense, which, as you know is very high, and be able to predict that, has really been a Godsend. However, you have to get to the right person who has that budget. That is very important. Therefore, we went from thinking it was an HR problem; it is really a financial problem, a big financial problem.

CEOCFO: *Are you seeking funding, partnerships or investment as you move forward?*

Mr. Burt: That is a great question! Frankly, I have bootstrapped it at this point, because I am just fascinated by it. I am not a data scientist, but I have been training myself through online courses and all kinds of webinars and seminars. We hired doctors, PhDs if you will, in data science. These young people come here, and they are very bright, and they are, of course, right in the crosshairs, too, when it comes to their age, illnesses and of course medical expenses. Therefore, we think that approach of bringing in young people that have ideas outside of the box has been very critical to our success and our growth.

CEOCFO: *What are your next steps?*

Mr. Burt: You did ask about funding, I am sorry I got sidetracked. Yes, we want to keep growing, we've put together an investment deck, we have our pro forma and will be seeking partners. It

could even be healthcare partners. We do know that major hospital systems and insurance companies like Anthem and Blue-Cross have partnered with or purchased data science companies using this technology internally, so we know that we are on the right track. This technology really is the next evolution of healthcare and a total game changer.

CEOCFO: *What is the competitive landscape? Have there been other attempts to use this approach?*

Mr. Burt: No. You can certainly do your own vetting on that. However, I can tell you that one of the reasons I was so compelled to do it was because I could not find anyone else that was. That is a peril as much as an asset. The peril is that you say machine learning and people gloss over. "Oh no, that's robots, right? That is autonomous driving." This is true, but all of that boils down to a machine learning or a "deep learning" infrastructure, which is what we do. We just do the deep learning and machine learning.

A healthcare system could come to us and say, "We would like to do some machine learning on our employee engagement or our patient engagement. Right! Well, we will tell you what data we need, and we will start writing those algorithms; you can write an algorithm for anything. Therefore, we could be very helpful to healthcare, without question and we already have a few hospital clients, currently; that we are doing this for and regular employers, one of them is an educator and a university. Therefore, they are particularly interested because generally, every university has a class on machine learning, so they want to see how we are deploying it. However, things change rapidly Lynn. I can tell you, you really have to stay sharp on this stuff, I mean every day!

CEOCFO: *Why is Data245 important?*

Mr. Burt: It is the only science that allows you to foresee the future. I will give you a very quick and graphic example. Even our most powerful laptops and desktops that we have here; and we try to buy the best, can only process an algorithm. It takes about two hours to process one algorithm. That is an excruciating amount of time when it comes to data, and that is sort of at the speed of light! Therefore, we partnered with Google and they allow us to upload our algorithm and then it gets run by them in their supercomputers, which they say transacts one trillion transactions a second! Therefore, these super computers are massively powerful.

Then when we get to quantum computing in the future it is going to be a different scenario. Let us assume you practice piano and you put in five hundred hours. You would be pretty good at piano. You would not be great, but at least you could play a song and if you had one thousand hours you would be even better, twice as good, perhaps! Therefore, imagine if I could put a chip in your head that gave you the ability to have known one million hours of practice. Needless to say, you would be the best pianist in the world! Therefore, that is exactly what is happening.

We are teaching the computer initially and correcting its errors if it is learning until it gets to the formula, the algorithm correctly. We then apply the data from the client. We apply test data, which is from other health systems around the country, prescription drugs and some states give us their data too, by the way. You can imagine how quickly it will go through millions and millions and millions of transactions and it does predict what is going to happen in the future. It is really remarkable technology. Now, you hit on it earlier. We do not have a competitor yet. We have not found one. We would like if there were one, because it validates what we are doing. There are plenty of machine learning companies out there in the hospitals, but they have not focused on employee benefits spend. Not one of them and this is why we are unique.

CEOCFO: *Is there anything that people might miss when they first take a look at Data245?*

Mr. Burt: Thank you. I think what they are missing is that it is a bold initiative. However, there is a fear factor. I do not know machine learning. I do not know anything about artificial intelligence. It is somewhat intimidating. To tell someone you can look at data and predict the future almost sounds like snake oil. Think about autonomous driving and Tesla! It can drive you home if you are passed out. They had done that through countless hours of collecting data and putting it into a database and learning from itself. Therefore, if a Tesla made a mistake and turned into a curb or a fire hydrant, it would learn that that is a mistake and then it would not replicate it ever again. Therefore, there is just the general "I do not understand" factor to this science. Like any new science, some people are skeptical. Therefore, we just want to show them how we do it, produce it with a sample report for them and make them comfortable that this is really revolutionary.

