

What Healthcare Analysts Can Learn About Data Analytics From the World of Surfing

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What if I told you that I have learned several key principles about healthcare analytics from observations about the dynamic world of surfing? The extraordinary financial investment healthcare systems have made in technology has been made with the belief that this technology can help improve care delivery and lower costs. That's true to a degree.

What is probably not well understood is that health systems will never fully realize the potential of their technical investments if there are not equally skilled operators that can leverage the procured technologies. Those technically skilled operators include data architects, data engineers, and data scientists, but for the purposes of this article, I will refer to them as healthcare analysts. My goal is to share three principles I learned from surfing that will help healthcare analysts add value to the organizations they serve.

Surfing Lessons Applied to Healthcare Data Analytics

On a warm morning last December, I joined a group of friends for my first-ever surf lesson. I was thrilled because surfing was something I'd always wanted to try. After some beach-side instruction, our surf coach put us in the water and we paddled out to meet the waves. At first, I struggled to get up on my board, then to stay balanced, and then of course to get the timing right to catch the perfect wave. I did manage to catch a few waves by the end of the lesson and I felt huge sense of accomplishment—and later soreness.

Two days after the surf lesson, my wife and I traveled to the North Shore of Oahu, where the 2017 Pipeline Masters was kicking off the next day. This was the culminating event of the year for the best surfers in the world. The competition featured perhaps the

most famous surf spot in the world, known as the Pipeline, aptly named for its fast rising waves that form perfect curls along a dangerously shallow sea floor.

With the competition a day out, the beach was relatively unpopulated and afforded us an unobstructed view of these world-class athletes as they practiced for the competition. There were lots of a-ha moments for me that day. As I watched with binoculars in hand, it became clear to me that I had no idea how to pick a good wave. When I thought I saw an awesome wave rising behind a set, I would think, “Oh, this is a great wave!” And none of the surfers would take it. Much to my dismay, a wave would then rise up, seemingly out of nowhere, and two or three surfers would paddle like crazy and one or two would make the drop onto a huge wave I hadn’t even seen coming.

This turned into a game where I would try to pick the waves that the surfers wanted to ride. But I couldn’t do it. I couldn’t make sense of what they could see. That especially bothered me because I was on higher ground and I could see much farther than they could, especially with surfers lying down on their boards, bobbing among the wave peaks and valleys. But time and time again, they picked waves I couldn’t see. And I picked waves that turned out to be duds.

Since I couldn’t pick out the winning waves, I spent the rest of my time looking for patterns. I found three. Months later, I learned that these patterns proved to be principles. They were validated by surf legend Gerry Lopez, who I was fortunate enough to learn from. My goal is to pass these principles on and their very real application to the world of healthcare data analytics.

Principle 1 – Understand the Shifting Environment

My first observation was that the waves were dramatically affected by external factors. As we watched, a slight breeze developed, blowing to shore with the waves. This made wave rise faster and proved more challenging for the surfers. After some time, the wind changed direction. This slowed the curl, resulting in a more dramatic rise, the waves becoming more dangerous as the waves amassed more water with each swell.

Sitting near some of the pros, I asked why the waves seemed to be getting bigger as the day progressed. They said that there were storm swells that had been moving toward the North Shore for the last week and the front had just arrived. The waves were indeed increasing as the storm swells finally made landfall. All the surfers were well aware of the external factors influencing the waves and they adapted accordingly. As Gerry Lopez said, “High-level surfing is only possible with an acute state of awareness, a deep connection to the immediate environment, and the ability to be totally, absolutely in the present.”

Do you understand the shifting environment of healthcare delivery and reimbursement?

External factors are reshaping the healthcare delivery landscape: mergers and acquisitions, at-risk contracting between payers and hospitals, a mixture of reimbursement models, and a complex payer mix. This is the reality of healthcare today.

As an analyst, it's insufficient to model and forecast increasing volumes and charges. A good healthcare analyst must do that and explore care models that deliberately drive profit away from hospitals into ambulatory settings, while being mindful of the impacts (good or bad on at-risk contracts). They should also be cognizant about supporting population health initiatives. There's a clear need for healthcare analysts to understand the pressures on the system so that their analyses can help leadership develop strategies that will improve care delivery and keep the health system open and profitable.

Principle 2 – Know When to Say “No”

The second principle is knowing when to say “No” (so you can say “Yes” at the right moment). A good surfer is patient. She knows it takes tremendous effort to catch and ride a wave. There is only so much energy one can expend before fatigue sets in, so being deliberate about choosing waves is crucial.

This was evident watching the world-class surfers on Pipeline. In fact, I began counting, and, on average these athletes were saying no to 20 waves before saying yes to the right one. “Doesn't that seem wasteful?” I thought to myself, “Wow! Look at all those great waves going un-surfed! 20:1?”

That average held out that day on the Pipeline. I'm sure it varies from beach to beach and day to day, but it intrigued me that the surfing elite were allowing good waves, even great waves, to pass by them and only committed to the best waves of the day. There were less skilled surfers content to take the good and better waves, but not the pros. What set apart the pros from the others was their ability to see, catch, and ride the best waves.

Are you saying no to the wrong opportunities, so you can say yes to the right ones?

This past year, there was a moment where I sat in reverent awe watching an analyst lead a Senior Executive Team for a large Integrated Delivery Network (IDN) through thoughtful analysis of care delivery throughout the system. This is a system generating billions in annual revenues.

She made a compelling case to stop chasing less impactful work and invest analytic effort along with process improvement discipline in areas the organization wasn't sure they could actually improve, fundamentally changing the executive strategy as well as the direction of the ACO.

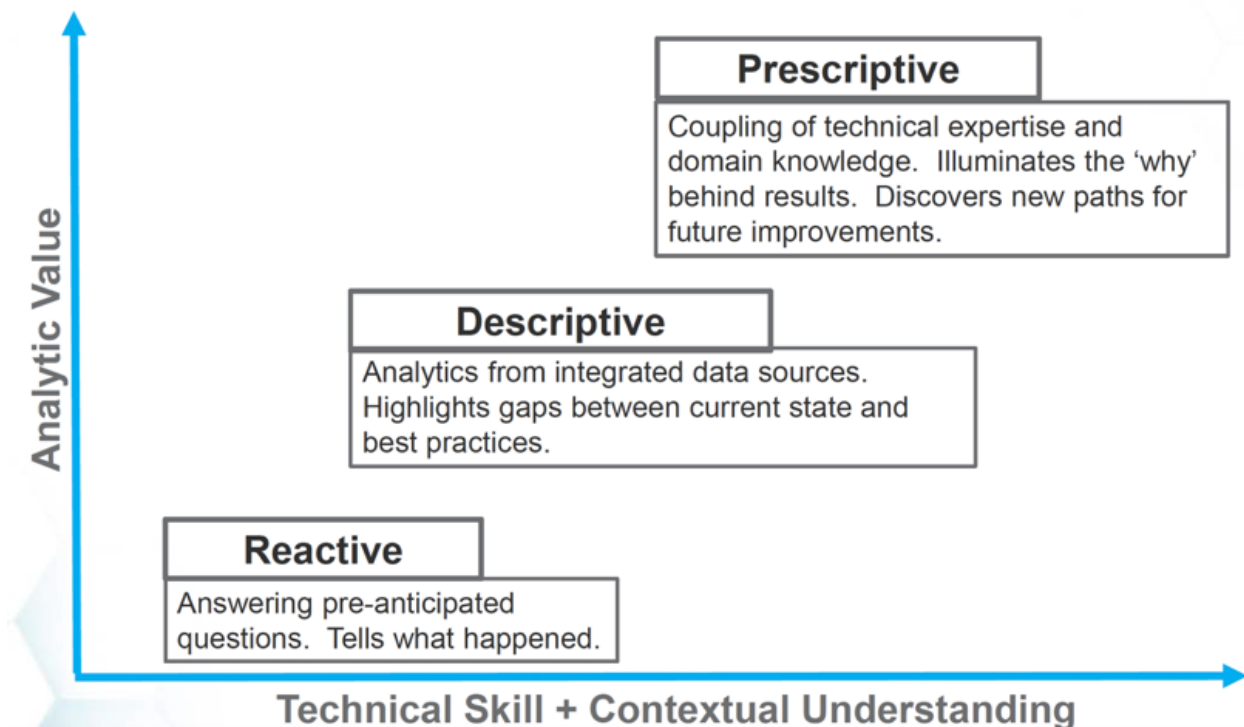


Figure 1: Moving from Reactive to Prescriptive Analytics

In the graph above, a rise along the Y axis represents an increase in analytic value. The X axis represents a combination of technical skill and contextual understanding of how the information will be used.

Reactive Analytics

The simplest type of analytics is reactive analytics, such as a count of activities or list of patients. Reactive analytics includes basic calculations on industry accepted metrics such as a heart-failure admission, answering pre-anticipated questions and generally confined to a single source of data. Many reactive analytics are included as part of a vended system, particularly EMRs. Consequently, the report writer’s contextual understanding of what is being measured in the report, and why it matters is often remarkable low. Reactive analytics explains some of the what but does not explain the why.

Descriptive Analytics

The next type of analytics is descriptive analytics. This type of analytics is moderately complex and attempts to describe the world of healthcare around us. Analytic work of this nature is usually performed within a dedicated analytic environment.

Descriptive analytics leverage highly-customized data models. These data models are populated with multiple sources of data (EMR, claims, human resources, lab, professional billing, etc.), all organized around a given domain. Data provisioning and integration efforts into an Enterprise Data Warehouse (EDW affords a more

comprehensive view of activities within the health system as a whole.

Descriptive analytics gets us much closer to understanding adherence to (or departure from) clinical best practices. They also allow us to better understand financial impacts of consistent clinical outcomes. The achievement of descriptive analytics requires significant interchange between technical experts and domain experts. As a result, these technical roles have a strong understanding of how analytics integrate into workflow, and at a macro level, how they address external pressures exerted on a health system.

Prescriptive Analytics

The most valuable analytics are Prescriptive Analytics. Simply put, this is where the why gets explained. Clinical improvement, waste reduction, and financial opportunities are discovered through applied prescriptive analytics. Root-cause analysis is a key function of this work because once we understand the processes contributing to the waste, we have the information we need to start addressing meaningful change.

They are prescriptive because they make the needful action clear. Sustained prescriptive analytics requires technical experts and domain experts to work side-by-side in permanent fashion.

The analyst mentioned above helped the leadership team see they were constantly asking for reactive analytics, and they needed to raise their own analytic acumen. This took some time, training, and patience, but they could see there was a better way. This happened all because an analyst said “No” to 20 requests so she could say “Yes” to the right one.

Principle 3 – Get Good at Positioning

The third observation on the Pipeline day was that the best surfers never sat still. This might sound obvious—of course they’re going to keep moving. They have to. The ocean is moving and so must they. But it’s more than that.

The surfers’ movement was thoughtful, deliberate, and purposeful. The reason for the movement was to position themselves so that they could capture the best waves. The pros moved in packs. At one point they were 100 yards off-shore to my left. Ten minutes later, they were 75 yards offshore directly in front of me. Then, 20 minutes later they were 150 yards out and much further left. As the conditions changed, so did their positioning.

They didn’t get stuck thinking, “There were great waves here 10 minutes ago, so I think I’ll just stay and wait for those waves to come back to this spot.” Instead, they chased the opportunities amid changing conditions.

How were they able to pivot and adapt? Gerry Lopez taught me that there were three reasons. First, they could actually identify the best waves (Principle 2). Second, they could read the changing conditions (Principle 1) and recognize where the best opportunities were surfacing. And third, they are in shape (Principle 3). Their extreme fitness coupled with their domain knowledge allowed them to repeatedly get into a

position that would allow them to catch the best waves. In his words, “Surfing is 90% paddling, which is gut-busting work ... all for a brief ride that is only seconds long.”

Are you developing the important skills and knowledge base to position yourself to identify and capture opportunities?

Great healthcare analysts, like great surfers, are good at helping the organization get into position to capitalize on opportunities. To the untrained eye, they seem to have a knack for where the next opportunity will crop up and somehow, they’re in the right place at the right time. That knack is actually the result of two things. First, they’ve obtained a fundamental knowledge of the healthcare system. And second, they are technically “in shape” enough to maneuver to where the opportunities might arise around their system. This is where technical aptitude plays an important role. The best surfers are in top physical condition and the best analysts are in top technical condition.

Lead with “What Problems Need to be Solved?”

I’m going to say something that may sounds surprising: health systems don’t hire analysts to run reports or build dashboards. They don’t hire analysts to leverage the fancy technology they purchased. These may be duties assigned to an analyst, but that’s not where their value lies. They hire analysts to solve problems—period.

My conversations with executives and analytics directors this past year has validated that their top healthcare analysts use a common approach to adding value. It’s a pattern of thinking to solve problems that looks something like this:

- **Healthcare Operations** – First, their top analysts ask lots of questions that seek to understand, “What is the problem we’re trying to solve?” and “Why does it matter?” This deliberate questioning helps to tease out the best opportunities.
- **Healthcare Data** – Next, the analyst asks, “What information would be needed to help solve this problem?” Top analysts turn data into information so what they’re getting at is, “What data do I need to begin to address the issue and where do I find it?”
- **Technical Skills** – After finding the data, the analyst then asks, “How does this data need to be organized, analyzed, and presented to address the problem?” And, “Who do I need to present this information to so they can make a decision based on the information I’ve shared?”
- **Tools** – The last step top analysts take is reach for their tools. This process re-frames the role of technology. When analysts see their role as problem solvers, they effectively become partners for clinical, financial and operational teams.

The pairing of technical fitness with domain expertise becomes a sustainable model for analysts to become a tremendous asset to be leveraged. In the words of Jim Collins in *Good To Great*, “Technology cannot turn a good enterprise into a great one, nor by itself prevent disaster.” The same holds true for analysts. No technology will make someone a great analyst.

Healthcare Operations	Healthcare Data	Skills	Technology
<ul style="list-style-type: none"> • Acute care • Primary care • Population health • Risk-based contracting 	<ul style="list-style-type: none"> • ICD codes • CPT codes • Rx orders • Rx fills • Lab order • Lab result • Vitals • Problem list 	<ul style="list-style-type: none"> • Data query • Data movement • Data modeling • Data analysis • Data visualization 	<ul style="list-style-type: none"> • Data ingestion and integration platform • Data relationships • Statistical modeling • Dashboards and KPIs • AI and NLP

Figure 2: Healthcare Analysts must have technical fitness coupled with knowledge of healthcare data and operations.

Five Necessary Technical Skills Data Analysts Need

The best surfers are in top physical condition and the best analysts are in top technical condition. Below are the top five technical skills absolutely necessary for analysts to catch the best waves of opportunity within health systems.

1. Data query, or SQL.
2. Data movement
3. Data modeling
4. Data analysis
5. Data visualization.

Lessons Learned

To summarize the lessons the world of surfing can lend to healthcare data analytics:

- Analysts should develop the skills and knowledge they need to support improvement in healthcare.
- Understand that the business needs will help you better position the organization for opportunities ahead.
- Technology accelerates but doesn't supplant the knowledge and value of the five key data skills.
- Leaders need to invest in education for analysts to grow into a deeper understanding of healthcare data and operations.

A Catalyst for Change

I feel blessed. Every year, I'm fortunate to ski the greatest snow on earth right here in Utah, some days, choking on powder turn after turn. Wonderstruck, I've sat at the

Rim of the Grand Canyon gazing on the cavernous divide and serpentine water below. I've hiked in the Canadian Rockies and lapped my feet in the cobalt lakes beneath the peaks. I've canoed in the still waters of the Snake River and watched the sun set on the Tetons in Jackson Hole. These are breathtaking vistas. And I've loved them. They've inspired me.

Even more inspiring and far more lasting are the views afforded me within healthcare systems. I hope you feel the same. As analysts, we have the most amazing jobs in the world. We get to work with passionate people, the educated elite of the world who have chosen to put their time and talents to use for the betterment of society.

The cause of clinicians is noble. Your role as analyst is equally noble, and in a real way, far more reaching and lasting. Your hands, your work, your ingenuity can touch the lives of tens of thousands of patients. As you come to better understand the system of care delivery, you hold caregivers in your hands, in your SQL, your data models and in your analysis. Your scrutiny of their data and protocols will influence their care delivery. After one such analysis, early in my career, the Medical Director for Primary Care sat quietly studying my analysis of his co-morbid diabetes and depression patients, he looked up at me with tear-filled eyes and said, "John, this changes the way I practice medicine." In that moment, I found my career.

Analysts—you're a Godsend in this healthcare crisis. Your analysis truly can help systems lower costs, making care more affordable. You really are finding ways to make care accessible to the masses. Your technical fitness will help administrators find new waves of opportunity to better serve the patients in their communities. No, you're not just an Analyst. You are the Catalyst for change. Thank you for choosing this career path. Thank you for your courage and compassion. 🙏

About The Author



John Wadsworth is the VP of Technical Operations at Health Catalyst. John joined Health Catalyst in September 2011 as a senior data architect. Prior to Health Catalyst, he worked for Intermountain Healthcare and for ARUP Laboratories as a data architect. John has a Master of Science degree in biomedical informatics from the University of Utah, School of Medicine.