McKinsey&Company

Wan-Lae Cheng,
Tom Dohrmann,
and Jonathan Law

The AI factor in talent management: An interview with Catalyte's Jacob Hsu and Mike Rosenbaum

Public and Social Sector Practice August 2018

Top executives at one innovative software development firm share how they harnessed artificial intelligence to create a more diverse—and more productive—workforce.

Artificial intelligence (AI) has been heralded for its potential to reshape entire industries by enabling new business models and uncovering previously untapped opportunities. It would stand to reason that AI could have a similarly transformative impact on talent attraction, retention, and development. To date, however, few companies have been able to use a data-driven approach to pinpoint the attributes that can predict an individual's ability to succeed in a given role.

One company that has is Catalyte, the Baltimore-based software development and AI firm. Since its inception in 2000, founder Mike Rosenbaum and CEO Jacob Hsu have pioneered a methodology and algorithm that successfully predicts the ability of candidates to succeed as developers—even those that lack traditional credentials, skills, or training. This breakthrough, along with a workforce development model that features intensive training, mentorship, and defined career pathways, enables the firm to assemble software teams that significantly outperform traditional approaches. And at a time when the tech industry is struggling to achieve greater diversity, Catalyte has been able to create a workforce that more closely resembles the population at large.

McKinsey sat down with Hsu and Rosenbaum to discuss Catalyte's application of AI, how it removes bias from the evaluation process to increase diversity, and the importance of providing candidates with access to the first rung on the ladder in their careers.

McKinsey: *Does the war for talent in a tight labor market inevitably make it harder for companies to identify promising employees?*

Jacob Hsu: Let me answer with a personal anecdote. Before I joined Catalyte, I used to run a fairly large offshoring company. I was literally hiring kids out of villages in China, India, and the Philippines who, within a few years, were becoming world-class developers. Some of these

Jacob Hsu

Career highlights

Catalyte
2016 to present
CEO

Symbio
2001–16
CEO

Education

University of Pennsylvania
1992–96
BS, Economics

Wharton School of Business
1992–96
BA, Finance

Mike Rosenbaum

Career highlights

Arena
2014 to present
Chairman and CEO

Catalyte
2016 to present
Executive chairman

2000–16
Chairman and CEO

Education

Harvard Law School
1995–98
JD

The London School of Economics and Political Science
1994–95
MS, Economics

Harvard University
1990–94
BA, Russian Studies and Government

Visit McKinsey.com to watch the following videos:

Building a talent pipeline

Creating a more diverse workforce

people became fantastic entrepreneurs who went on to build some amazing companies. That was one of the first inklings for me that the signals we've used to assess skills in the US have little relevance to successful outcomes on the job.

Companies look for people who can solve problems in stressful situations and make decisions in a more structured and systematic way. Those are the skill sets that I think are going to be important for the future because the jobs that are going to be transformed, the professions that we're going to end up with after automation, robotics, and things start to take away a lot of the routine work, are all going to require critical thinking and problem solving.

At Catalyte, we built our business model on the fact that you don't need to have a pedigree to be a developer. A lot of it really is finding the best people who think a certain way, who have the right aptitude for this work. AI can predict that.

McKinsey: *Describe how you have used AI to find better candidates.*

Mike Rosenbaum: Some industries—such as hedge funds and the high-speed trading industry—were early adopters of AI. Today, it's possible to take that technology and apply it to a different problem: workforce and the labor market. The technology allows us to find the best workers without being hobbled by the typical barriers and perceptions.

The conventional approach to assessing candidates would be to identify traits and then figure out some way of prioritizing them—for instance, a company might decide it needs someone who is extroverted, a good multitasker, and great at problem solving. The assumption that those traits are the most important is inherently a subjective thing. The key, actually, to finding the right people is identifying the metrics you're trying to move the needle on and then tying them to data you can collect on a person.

It took Catalyte a long time to develop our model. We experimented a lot. Frankly, for years we just threw spaghetti at a wall. We had people do activities like put together Tinkertoys, and we measured all kinds of associated data points. There was a piece of research that had come out of Johns Hopkins that said rapid eye movements correlated with the ability to defer gratification, and so we tried to use cameras to measure rapid eye movements and then correlate that data with software engineering outcomes. Another test involved asking questions where the initial assumption was not correct and then timing the amount of time it took someone to realize their initial assumption was incorrect. That frequently has some signal.

It was three to four years before we could really get any level of statistical significance. And after that it was a few more years before our accuracy rates were high enough to make the model work consistently.

McKinsey: *Once you were able to identify promising candidates through AI, how did you mold them into software developers?*

Mike Rosenbaum: We would spend 16 to 20 weeks essentially having them do stylized versions of past client projects. Part of the puzzle is the ability to know how to build software, to be able to work on a team, and to be able to understand the big picture. What we do in that 16 to 20 weeks is fill technical holes while helping folks understand the processes and methodologies of building large-scale software as part of a team.

Jacob Hsu: A unique part of our approach is that the teams are actually taught to master that material as a group. We're not tracking how individuals are progressing at coding. We're making sure that the cohort can actually solve problems together every day. Mentorship is also a key part of what we do; it's a lot of peer-based learning.

Our cohorts learn as much from each other as they do from an instructor or even from the content and material. And that's by design, because at the end of our program they are developers. That's the beauty of our model: our instructors are people who've usually gone through the program. In fact, as they move into leadership positions within the company, we encourage them to be a trainer and lead a cohort at some point in their career. That's what makes this model sustainable.

The reality is that every developer is probably 6 to 24 months away from obsolescence in terms of their core knowledge set. You have to constantly be acquiring new knowledge, platforms, and technologies. We're setting up our people to get used to this pace of acquiring knowledge on a continuous basis in a very rapid way and being able to process knowledge on their own, whether it be through friends or peers. That's really the journey, and that's also how we think about long-term career development in the company.

McKinsey: *Two striking aspects of your model are the degree of diversity in your cohorts and their level of performance. How have you accomplished that?*

Jacob Hsu: Our software developers are much more diverse than the norm. Take our first development center in Baltimore, Maryland. The Baltimore metro area is 28 percent African American. We happen to have 26 percent African American developers in our Baltimore development center.

We're now operating across the country. What's really fascinating for us is every cohort that comes in matches fairly closely the demographics of any city that we're operating in. African Americans are 13 percent of the population, and we have exactly 13 percent African American developers. On gender, we're at 31 percent female developers. Every city that we're in has slightly different-looking workforces, so it's really reflective of the demographics of the

region we're hiring from. When you take humans out of the hiring process and you're using fundamental aptitude versus tacit knowledge that we're testing for, that actual ability is very evenly distributed across society.

The first time clients hear about what we do, they are skeptical. Then as they get closer, do their due diligence, and understand how we work, they see that our teams are fundamentally outperforming their teams. Our teams are, on average, three times more productive than the incumbent services provider they were working with. Our teams produce 30 percent faster velocities in sprints and our work is higher quality. That makes clients realize we have a fundamentally different way of approaching this kind of service.

McKinsey: *How do you create career pathways for your employees to ensure they use this training as a springboard?*

Mike Rosenbaum: When folks start at Catalyte, they are in engineering but they can take several paths over time. One of those pathways is to become an architect. Another is to start leading teams in more of a managerial capacity. And the third is to become a contractor by starting their own business and working for us or another company. Different individuals have different tolerances for risk and different desires to be on their own. The key for Catalyte is to make all those pathways available, and to provide support to break down those barriers for individuals as they grow through their careers so that they can be successful along whatever path they want.

Jacob Hsu: We really believe that a big part of our students' success is the fact that they go through training together as a cohort, so it's a safe space for people to learn.

One of the challenges that we have when we think about training or redevelopment programs is that we tend to think of it as an institution and the student or the trainer and the trainee. In reality, there's a whole support network around it. That's how the professions of the future are going to be. We're trying to give people that environment where they can not only have support from the company but they can build their own support networks; they can find and acquire knowledge where and when they need it.

We really believe that a big part of our students' success is the fact that they go through training together as a cohort, so it's a safe space for people to learn.

McKinsey: *Can the Catalyte model be replicated in community colleges?*

Mike Rosenbaum: It is really hard to align the incentives of community colleges with those of private enterprise. Can community colleges and postsecondary educational institutions play more of a role? Yes. Are there ways that we could restructure some of the incentives to create tighter alignment there? Yes. But is it fair to expect that a community college or a postsecondary educational institution can play this entire role? I think that is unfair because they're thinking about the workforce more holistically while we are building a workforce specifically for our firm.

Jacob Hsu: One of the things I think is missing from postsecondary institutions is this ability to actually bring people together as a group to solve problems. Now you see that in certain MBA programs, where there's a cohort and a project-based orientation. I think that really needs to start happening across a wide swath of professions.

As a society we have to fundamentally reexamine some assumptions about education and job qualifications. I think it's time to kill the résumé. For most job categories, there is very little correlation between a person's previous work experience and her ability to be successful on the job. In fact, there are some extreme categories, such as help desk engineers, where we found it was better to have somebody who had no experience and then train them to do it rather than find someone who had been working in that job before. So, the real question is whether you can give your workforce opportunities to grow within the organization.

McKinsey: *You both have almost a missionary zeal for Catalyte's mission and its impact. Where does that passion come from?*

Jacob Hsu: The power of that first job to change the trajectory of a whole family—that was something that really spoke to me. Many of our people are coming in literally making minimum wage. We have people who have been working in fast-food restaurants their entire lives and realize that there's something more. The profile of people coming in is really all over the board, but mostly it's working-class people who are joining Catalyte at the top of the funnel. Within five to eight years with us, they are making six-figure salaries.

I couldn't let go of this idea that our company could take anybody from the base of this economic pyramid to the top within a decade. There are very few institutions that can do that in a predictable way. Our strategy today is to launch 20 development centers in 20 major metro areas here in the US. The goal is to replicate a lot of that same economic and workforce development across the country.

Mike Rosenbaum: The way the US has been operating since its founding is that each of us, based on our own merit and effort, can achieve things that our parents and grandparents didn't achieve. That creates the possibility of an upward trajectory. The problem is that when you have certain structural barriers in place due to macroeconomic shifts, bad stuff occurs. If we want a society where hope can continue to drive us forward, we need to ensure that merit and effort can still overcome those barriers. I'm committed to this concept, and it has kept me going even when business was tough. ◻

Jacob Hsu and **Mike Rosenbaum** are members of the Markle Rework America Task Force, a group of leaders who are seeking to transform our labor market from one focused solely on traditional credentials to one rooted in skills needed for the 21st century.

Wan-Lae Cheng is an associate partner in McKinsey's Boston office; **Tom Dohrmann** is a senior partner in the Washington, DC, office; and **Jonathan Law** is a partner in the New York office.