Why More Startups Should Be Developing SaaS Software for the Enterprise

Enterprises as a whole are spending $500 billion every year on legacy systems, but very few startups are tackling this opportunity. It is not for lack of interest in the market, though. In the past ten years, there have been over fifty IPOs in the enterprise space; and companies like Salesforce.com, Box, Lithium, and Yammer are continually disrupting the market by delivering products with faster deployment times, better pricing, and smaller IT footprints than their legacy counterparts. There's a huge opportunity in enterprise SaaS software that's just ripe for the taking, and if the right startup with the right product comes along, it could change the face of the enterprise.

So Why Aren't There More Startups in Enterprise SaaS Software?

One of the major takeaways from Disrupt SF this past year was that the enterprise is the next logical market for startups to tackle. However, the majority of engineers and entrepreneurs appear to be focused on creating consumer-facing products that are quick to build and quick to enter the marketplace. The result seems to be a startup culture that is more concerned with getting acquired by larger companies than building something to change the way we do business. Making money is important, of course, but as previously mentioned, there is money to spare when it comes to enterprise software.

Why Startups Should Focus on Enterprise SaaS Software

There may be a perception that VCs are focused primarily on consumer-facing startups, but that simply is not the case. Angel investors and billion dollar funds alike are pouring funding into enterprise SaaS software, and the boom in enterprise IPOs just demonstrates that this trend will continue to grow. Clearly the business world is ready for change, and the market for B2B technology enabled services is wide open.

Another reason is that the decrease in the cost of IT infrastructure, as well as the proliferation of pervasive connectivity, has created endless opportunities for new startups with innovative and disruptive business models to penetrate this market and completely change the competitive landscape. Moreover, revenues are far more dependable in the enterprise space, whereas consumer-facing technology can be difficult to pin down if a startup does not firmly establish what its core demographic is and how they plan to reach it. Even then, B2C startups fail all the time because a bigger name does the same thing, but better.

The Shift to the Enterprise is Already Upon Us

Although there are companies focused on the enterprise, the list could certainly be longer and

more comprehensive. Entrepreneurs, founders, and engineers alike need to start thinking outside the box of consumer driven software and seriously contemplate what the next step forward in the enterprise could be. Anyone still not convinced should consider this list of the next 25 big enterprise startups according to VCs, and then note which ones they have already heard of. No doubt the companies on this list will IPO within the next couple of years if not sooner. It is by no means a definitive list, either. Rather, it is just the beginning.

The Future of Edtech: Will Consumers Invest in Education Startups as Much as VCs Are?

In the past decade, I've seen venture investments in education startups more than triple. In fact, it reached over $400 million last year alone. Even in the middle of a recession, VCs are investing heavily in edtech, but I wonder if we're taking a hard enough look at what where we expect this trend to go.

Avichal Garg, co-founder of PrepMe, makes a pertinent point that the average person sees education as an expense--not an investment. As a result, we can't expect education startups to function in the same way as any other consumer-oriented startup company. Not only that, but consumers generally don't want to pay for educational content that they believe they can find online for free. As I look around at the more successful companies in edtech, I've started to see a couple very important differentiators: focus on a topic and partnerships with educational institutions.

Focus is the Key to Success in Edtech

Trying to serve every educational need of every possible user does not work in the long run. The most successful edtech startups focus on specific topics as opposed to broader coverage of education as a whole. While quality of education is important, especially when it comes to learning online, having high quality services that are spread too thinly does not serve the user or the company. It's not so much about business structure in edtech as it is about focusing on a subject that people are passionate about.

Treehouse, for example, has focused its efforts on helping users learn web design and development, as well as mobile development. By zeroing in on this focus, it delivers a clear objective to users. Another example is LiveMocha, an ad supported startup that focuses on language learning. While one is paid and the other is free, both have carved out an important niche for their course offerings by establishing a focus, and both have been very successful in doing so to date.

Turning to Institutions Instead of Consumers

I think what we're also going to start seeing is more and more startups that look to sell into universities and school districts rather than to end consumers. While the consumer market is certainly not going anywhere, institutions of higher education and public schools alike are a huge part of the picture of edtech that many startups are overlooking.

Part of the appeal of Coursera, for example, is that it offers online classes from accredited and well-known universities, issuing certificates of completion from that university as well. By partnering with name-brand universities, Coursera ensures that its reach extends further. On the educational services side, there's another huge untapped market that's waiting for new innovations. Blackboard is notorious for being unwieldy and difficult to use, but there are few startups in the education infrastructure space to challenge the company's hold on institutions of higher learning. That's why I'm looking forward to seeing more of these startups narrow their focus and team up with universities and public schools in order to change education.

The Future of Edtech

While the consumer market is tempting to all entrepreneurs, I don't think that it alone will support the growing shift of investments towards edtech. Additionally, with so many edtech startups already offering free online education, the space will soon be overcrowded. That's not to say that the future in edtech is bleak--just that startups need to rethink the way in which they approach it.

The Benefits of Electrical Waveform Analysis in Improving the Business Operations of Enterprise Asset Management Systems

In the oil and gas industries, nothing is more important than ensuring that electrically driven motors and motor driven machines are operating at their peak performance 24/7. The average industrial facility employs a large number of electrically driven assets, and 10-20 percent of those are extremely critical to the everyday processes involved in regular operations. With so much depending upon those systems, unexpected failures can be prohibitively expensive. Not only can companies lose money due to unrecoverable lost time and production, but they also have to shoulder emergency maintenance costs and excess energy consumption from inefficiently operating machines that continue to run until they break down. Additionally, the potential safety and environmental liabilities arising from catastrophic failures are inestimable; and it can take an organization years to recover from such failures.

Considering everything that's at stake, oil and gas operators need affordable asset performance monitoring tools that can give them reliable and actionable information quickly. This includes not only electrical or mechanical failure detection, but also asset monitoring tools that can accurately

offer recommendations to improve energy efficiency. In the past, companies have traditionally relied on vibration analysis to monitor their motors; however, vibration analysis is costly, invasive, and tends towards delivering less reliable and consistent information when it comes to the state of mechanical systems. In contrast, continuous monitoring through electric waveform analysis is much more accurate and doesn't require access to the equipment itself. Rather than monitoring the effect of degraded assets on production over time, waveform analysis roots out the cause of mechanical failures before they happen because it constantly and consistently monitors the condition of an operation's assets and checks it against established baselines. The result is real-time analysis and observation of not only critical systems, but your entire motor population, saving time and money immediately.

What makes Electrical Waveform Analysis unique?

Many companies are reluctant to implement continuous reliability monitoring systems because they tend to be costly and take a great deal of time to implement since monitoring sensors need to be attached to motors and electrical assets. With electrical waveform analysis, however, a small monitor is installed inside the facility's switch room, and setup time takes a matter of hours rather than days or weeks. With this technology, engineers and executives can track small and slowly changing variations in the electrical waveforms, and this high degree of sensitivity to patterns provides more helpful and immediate results. Additionally, the information can be hosted in your own data centers or a secure private cloud and offers a clear and detailed view of history, trends, and forecast confidence—making monitoring electrical and mechanical assets as easy as opening a browser and logging into the software system.

How exactly does waveform analysis work? More specifically, the Predictive Intelligence Platform (PIP) collects waveform data and uses patented machine-learning algorithms to analyze and interpret that data continuously in real-time. The software identifies and distinguishes the sources of waveform distortion, whether it's caused by changes in incoming grid power, driven process, or asset conditions. Electrical problems are detected by empirically developing and tracking system impedance models. Classification and isolation of faults is accomplished by a combination of machine learning methods based on classifiers and specific spectral fingerprints of faults. The end-users have access to raw waveforms, spectral information, condition indicators and alarms about the monitored assets.

As previously mentioned, sensors are not installed in the machines monitored; instead, Predictive Intelligence Monitors (PIM) continuously acquire electrical waveforms at the motor switches at high sampling rates. Data is transfered wirelessly to the PIP server, which continuously analyzes these waveforms, identifying impending faults, as well as assess energy efficiency. The system then produces predictive and actionable intelligence from all the devices that operators want to monitor, both electric and mechanical. Thus, waveform analysis can detect anything from misalignment in bearings to eccentricity in rotors. That information is then fed into an organization's Enterprise Asset Management (EAM) system, which in turn will take action based on those results, such as ordering replacement parts and initiating related approval processes. To ensure that the entire asset team is always apprised of asset statuses, future

problem alerts can be sent on a regular basis to anyone who needs to know.

How is this different than Vibration Analysis?

Since the software continuously analyzes electrical waveforms, looking for evidence of arising mechanical faults and inefficiencies, waveform analysis is much more accurate and provides more actionable data than vibration analysis can by generating condition-related alarms rather than just providing trends and analysis over time. Additionally, waveform analysis can detect faults caused by torsional vibration, which traditional, lateral vibration analysis cannot. Electrical waveform analysis software learns the specific fingerprint signatures of monitored power trains, sets condition alarm thresholds, and then automatically enters the assessment mode to continually check for issues. Because it detects abrupt changes to and pre-existing conditions of the monitored assets, electrical waveform analysis assesses assets by comparing their actual, observed behavior to previous levels, helping engineers identify failures before they happen rather than depending upon manual inspections to uncover potential (or already existing) problems. In the end, engineers and executives alike receive real-time information on exactly how their assets are functioning at all times.

How Electric Waveform Analysis Works in Real World Systems

For a real world example of the benefits of waveform analysis, we can take a look at Chapparral Energy Inc., which implemented waveform analysis in its operations in the Mid Continent and Permian Basin. Chapparral had estimated proved reserves of 156.3 million barrels of crude oil equivalent and interests in over 3,000 producing wells, most of which are in mature oil and gas fields in Oklahoma, Kansas, Texas, and southeast New Mexico. Since a typical mature oilfield can have as much as 50 percent of its original oil still in place, Chapparral decided to implement a CO_2 compression system that would not only get old wells to produce profitably again (from less than a barrel a day to over 50 barrels a day), but also sequester CO_2 emissions from ethanol and fertilizer plants near its oilfields.

The system was a success, but because their enhanced oil recovery (EOR) infrastructure depended upon CO_2 compressors, pipelines, injection wellheads, and fluid separators, a failed CO_2 compressor could cause CO_2 volumes to the pipeline to fall by 50 percent or more, which would result in lost production time and costly repairs. In order to head off that possibility, Chaparral called upon Veros Systems to install a continuous monitoring solution that employed waveform analysis in order to detect any potential issues. Using a private cloud to access the software, the project team installed 13, non-invasive Predictive Intelligence Monitors in the Liberal, Kansas CO_2 compression facility - monitoring 12 compressors. Not long after going live, the new software detected a problem in three of the 12 compressors. Rather than having to worry about all the compressors failing, this allowed Chaparral to focus its limited resources on the problems with just those three.

Chaparral now uses PIP as a real-time and future view of this plant's portion of the company's

physical operations in order to establish a more methodical way to not only decrease the company's operating expenses, but also avoid losses in production. Moreover, Chaparral's engineers and facility managers shifted to a predictive maintenance system, which now allows them to avoid taking equipment offline unless it's completely necessary. In the end, the waveform analysis software helped Chaparral save around $100,000 by identifying key mechanical problems and disregard false alarms and avoiding unnecessary repairs on entire systems instead of just the components that actually need repairs.

Conclusion

Electric waveform analysis does a great deal to assist oil and gas operators to reduce downtime in electrical and mechanical systems by eliminating many of the manual processes associated with asset monitoring, thus closing the gaps in an organization's EAM strategy. By utilizing its unique patented software, waveform analysis provides engineers and executives with a clear view to detect future reliability and energy efficiency in their assets. Additionally, by employing out of the box software that can integrate easily with SAP and IBM EAM solutions, Veros Systems in particular makes employing waveform analysis in existing systems simpler and easier. In conclusion, continuous electrical waveform analysis integrated with EAM solutions not only provides actionable data that oil and gas operators can use in the day-to-day monitoring and maintenance of their electrical and mechanical assets, but it also saves valuable time and money in the long run by helping them avoid needless repairs, as well as head off potential failures before they happen.