

Aspen Technology Inc Investor Day - Final

FD (Fair Disclosure) Wire

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Body

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* Josh Fredberg

Aspen Technology - SVP of Products and Marketing

* Suresh Sundaram

Aspen Technology - SVP of Products and Market Strategy

* Karl Johnsen

Aspen Technology - SVP of Finance, CFO

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Nexen

Presentation

ANTONIO PIETRI, PRESIDENT AND CEO, **ASPEN** TECHNOLOGY: All right. Good afternoon and welcome to **Aspen** Technology's 2016 Investor Day. We're hosting the event here at our global headquarters in Bedford, Massachusetts. I also want to welcome those of you that are joining us on the NASDAQ website. I'm Antonio Pietri, the president and CEO of **Aspen** Technology. Before we begin with our presentations today I would like to take a couple of minutes to introduce the members of the **Aspen** Tech Board of Directors who are joining us today.

They are Bob Whelan, our Chairman of the Board, Chair of the Nominating and Corporate Governance Committee and member of the Audit and Compensation Committees. Don Casey, Chair of the Compensation Committee, Gary Haroian, Chair of the Audit Committee, Joan McArdle, member of the Audit Committee, Simon Orebi Gann, member of the Compensation Committee and all independent Board members are also members of the Nominating and Corporate Governance Committee.

So let me now review the agenda for today and as I review the agenda I will also introduce members of the **Aspen** Technology executive team that will be making presentations today.

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I will start with a company overview and a discussion around our strategy, that will take us probably until 2:00 p.m. today. Don't get worried.

Then we'll talk about value creation on product strategy. Josh Fredberg, our senior vice-president of Products and Marketing will start the discussion.

Josh joined us from ANSYS about 18 months ago. He was the CMO at ANSYS. He will introduce Suresh Sundaram who is our SVP of Products and Market Strategy. After that we will have -- in between we'll have a 30-minute break sometime around 2:45. I'd better not confuse my times.

And then as Suresh will come after that, we'll probably go until 4:00 or so once the market closes, then Karl Johnsen our SVP of Finance and CFO will come on and talk dual financial review and give FY '17 preliminary guidance. And then we'll have a Q and A session at the end. So that's the agenda for the next four hours or so. And let's get started here.

But first of all Safe Harbor statement regarding our disclosures today and I'll leave them up there for a second so that everyone reads it. And we also have a disclaimer regarding future product development or any discussion around future deliverables regarding our products, and the non-commitment to the claims or disclosures that we will make.

So let's talk about Aspen Tech and what we consider to be our business trends. So the company will be 35 years old this August. Over that time our products and solutions have become mission-critical for our customers, and that is because they create tremendous value for these customers and you'll see examples of that throughout the afternoon today.

That value creation has led to the establishment of a world-class customer base, the Who's Who of the oil, chemicals and E&C industries which has created for us a market leadership position that we have in the industry today and the multi-billion opportunity that we feel is ahead of us as well.

This is all supported by our revenue model which is now a subscription revenue model, having completed a transition last year that subscription revenue model is supported by long-term contracts normally on average of five to six years in length. And then this discipline that run execution in the company supports best in class profitability and tremendous cash flow generation, and then our focus on capital deployment to enhance shareholder value, whether that's for M&A, shared buybacks or R&D spend. And you'll hear some more about that later in the presentation.

So these are what we consider the basic strengths of the company, both from a products standpoint but also a business standpoint.

So talking about our industries we are concentrated into three industries and more than 90% of our business resides in these three industries, energy, engineering and construction, and chemicals. These are about \$10 trillion industries in a global economy close to \$80 trillion or about 12% of the global economy.

These industries are characterized by complex manufacturing processes. When you head of a project like the Sadara project in Saudi Arabia, JV -- between Saudi Aramco and Dow, a \$20 billion investment, 26 downstream manufacturing plants that will start producing about three million tons of product and will make Sadara a Fortune 500 company, the day that all those units come in line immediately.

So there's a lot of complexity, a lot of technology, high capital costs, not only build to these assets, as I just said \$20 billion to build that petro-chemical complex, the largest petro-chemical complex ever built in one place, by the way. High-volume production, if you think about it a typical refinery 200,000 barrels per day. If you buy crude oil at \$50 a barrel every day for 365 days, that's a \$3.67 billion bill only to buy that crude oil.

Exxon Mobile has 5.3 million barrels of refining capacity, the largest refiner in the world. Their bill is \$9.67 billion per year at \$50 a barrel. If you are able to save 1% of that bill every year that's \$967 million in savings per year, that's what we do, that's what our products do and we do a lot more than that. So this is why Aspen Tech is relevant. In

addition these are industries that require significant amount of technology and engineering to get through their day to day operations.

The dynamics for the industry, globalization, especially in the last 20 years, and I would say the last 10 years has become an incredibly globalized industry. Twenty years ago a lot of the supply chains were regional supply chains, then the Middle East started coming online, Asia-Pacific and lately in the chemical side North America with shale gas and the chemicals investment. The supply chains not only have expanded but have gotten stretched around the globe and are constantly changing.

Dow Chemicals in the mid-2000s made a decision to move all their chemical investment to the Middle East. Then in '09, 2010 shale gas came into the scene and they reversed their decision to move all their chemical investment back to the US because the US became the second lowest cost producer for chemicals but the logistics of producing in the US versus in the Middle East made it much more attractive.

So the supply chains are constantly changing. Market volatility and I'm sure that will be a topic of questions today. Oil prices going from \$100 a barrel to \$27 in January and now somewhere around \$45, \$50, creates tremendous challenges in managing this business and planning for the future.

Change in demographics, this is something that we hear from our customers all the time, the challenge that they're having with their demographics in their employee populations. They call it the two peaks demographics where there's a peak of employees that are nearing retirement and they're going to take with them a lot of expertise and experience about this industry. And the second peak is that new wave of college graduates that are being hired to replace the ones that are retiring. And their lack of experience or expertise in the industries, but a different expectation of not only software but in general what a job is these days.

Safety and environmental regulations and certainly I probably don't have to elaborate on that but a few weeks ago the explosion in Mexico of a petro-chemical plant, a joint venture PEMEX and Mexican cost the lives of about 27, 28 people, probably hundreds of millions of dollars in costs. Environmental regulations, and we all know about climate change, so it is only getting harder for these companies to operate in an environment where regulations are only getting stricter and tighter and operate profitably.

And of course the focus on operational excellence, but it's not only operational excellence it's capital topics excellence as well, is supply chain excellence and its organizational excellence and due to the demographics. What do they do to make sure that that knowledge and expertise that is going to be retiring is going to be transferred back to this new population of employees that are joining their companies.

So there's a lot going on in these industries, and the combination of the industry characteristics and the industry dynamics is what our products love. Our products love complexity because we optimize and every little bit that you optimize in an environment where there are huge volumes and huge investments translates into a lot of savings. That's the example about ExxonMobil and under crude oil purchases a \$1 billion if you can save 1% in the purchases of those crudes.

So those are the industry characteristics and industry dynamics. Of course the competitive dynamics are always changing and more so in the last 12 months than perhaps in the previous 15 to 20 years. Certainly the upstream and midstream sectors are significantly challenged. These companies are managing their business for cash flow generation and to maintain a certain degree of profitability.

Refining margins, the refining industry has certainly enjoyed a golden era of profitable operations, but at the same time there's stresses in the system where you'll see Japanese refiners are going through a significant restructuring of their business because of the economic environment in Japan. You see European refiners and European refineries are slowly closing down, but a lot of that capacity then opening up in the Middle East, opening up in Asia, some places in Latin America and so on. So there's shift in dynamics and the different players are constantly adjusting to changes.

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US refiners have been exporting products to Europe because it's been tremendously profitable for them over the last two or three years to sell their products in Europe. Latin America is coming up short on supply, and now a lot of the US refining production is going into Latin America because of a shortage of refining capacity over there.

Safe operations and what entails which is a lot, and then the increasing environmental regulations. And on the engineering and construction side the dynamics at the moment are ones of just managing through the downturn, that's what we're hearing from a lot of our customers. They want to understand what each other is doing and **Aspen** Tech has the benefit of meeting with a lot of customers in a global basis. And when I meet with our customers they start by asking me what are you seeing in the market? What is everyone else doing? They want to know if they're missing something about what the market and what they're supposed to be doing.

At the same time some of these E&Cs developed a strategy prior to this downturn that either by chance or design, positioned them in a more positive manner for these downturns, so you have the E&Cs that are focused exclusively on refining and chemicals and they are doing better than those that were focused exclusively in upstream.

The Japanese E&C had a strong focus on LNG and they were enjoying a nice run, even despite oil prices coming down. Now LNG prices over the last few months have been coming down and they are now seeing some stress.

Korean E&Cs were very focused on the Middle East and they are seeing a lot less investment. At the same time some of them spent a lot of time in Iran and see Iran as a big opportunity for them in the next few years because of the build-out that would have to take place in that country. As a matter of business they all feel for the most part they need to get better at estimating what it takes to deliver a project to their customers.

One of the issues they are facing is a lot of project cost overruns and therefore when we engage with these customers, one of the points of discussion all the time is our capital cost estimation product and solution. A lot of these customers are building departments and hiring more people just around the use of our technology because it gives them a better way to better optimize the cost estimate for their customers. ConocoPhillips using our capital cost estimation software was able to improve the cost estimation from plus or minus 40% to plus or minus 10% and that represented millions of dollars for them, for example.

And the one thing that we're seeing that is a common theme at the moment is a lot of these companies are looking for areas where to focus to generate new revenues and brownfield existing assets, not about designing a new plant or building a new refinery, it's about how can we contribute to improving the operations of existing assets and what services can they provide to their customers in that area. And this regard they are very interested in **Aspen** Technology because they know that a lot of that improvement in operational performance comes from our products and we have discussions with some of these E&Cs about leveraging our technologies in their focus on brownfield.

And then chemicals, certainly over the last 12 and 18 months is the area that I would argue is the best performing area. Certainly not only have their feedstock cost come down but the global economy continues to grow, their demand continues to grow and therefore their margins have improved. Dow Chemicals in this last quarter a record-ever profitability in their operations and that's because of the margins they're enjoying. I was in Asia last week and talking to a Korean chemical producer and they said exactly the same thing, record profitability and that's again the margin that they're enjoying at the moment.

There's new capacity, that capacity that was being built in Asia and the Middle East over the last three, four, five years and it's now coming online. The Sadara Project is starting up right now and it will take them another 12 months because it's such a large project. But also then you have the North American chemicals capacity that is being built now that will start coming into production in '17, '18, '19. So there is a wave of new assets coming online that will also benefit ourselves.

The supply chains, not only are they getting extended but they're getting reconfigured. Although the cost of building these assets have come down in the last 18 months which was one of the big issues in the energy industry. It's still very expensive to build these assets because of their complexity, and that's again an area they focus on.

And then the other major trend that we see happening is that a lot of the biggest chemical producers are moving up the food chain from bulk chemicals production into specialty chemicals. So the whole activism around Dow Chemicals and DuPont had a lot to do with that, divesting from low-margin bulk chemical assets into higher margins specialty chemicals.

There's other companies in Europe, DSM, Bayer-- even BASF that are migrating towards specialty chemicals away from bulk chemicals, the Middle East, China and other countries have become the bulk chemical producers in the world.

Having said that because of the US and shale gas and now being the second lowest cost producer in the world there's a lot of new bulk chemical capacity being built in the United States at the moment. So a lot is going on these industries and it's always been the case, but it feels like it just gets accelerated every year.

I talked to most of you about this all the time when we made the business environment while we're seeing as far as our business and I will try to encapsulate what normally takes 30 minutes to discuss in a few minutes here.

But on the energy side of course the CAPEX cuts, it's estimated at over a period of four or five years, that's about \$500 billion in CAPEX cuts announced and that will have a significant impact on the ability to ramp up oil production in the future. It's estimated that there's been about 325,000 lay-offs between the energy and E&C industries and that's certainly has an impact on the human capital that will exist in the industry as the industry recovers.

Certainly independent upstream, midstream companies are under financial duress or stress. We see that, we see that in the contracts that are coming up for renewal. Some NOCs are under significant stress and I would characterize those as NOCs that represent a significant percentage of their home country's financial revenues. And we've talked about some of those NOCs in our earnings call as well.

Downstream refining continues to be profitable. We're entering the driving season in the US, Europe and other places, and margins should improve over the summertime. Gasoline prices are increasing in the gas stations and that's margin expansion for refiners.

Integrated oil companies are leveraging their refining assets to maintain some degree of profitability, cash-flow generation and their ability to pay for those dividends. And that's certainly proving the strategy that some of these companies have had of creating integrated assets, both upstream refining and petrochemicals as well.

You've seen it, probably you've purchased your own big SUV, but in the United States over the last 12 to 18 months there's been a resurgence of big SUV purchases that's driving gasoline demand and increasing that consumption which is a healthy thing for the refining industry in general, and operational excellence is a priority. Every customer that we talk to has an operational excellence initiative, and we fit nicely into part of that initiative.

On the E&C side, well, the CAPEX cuts by these oil companies are having significant impact on the E&C companies. And like I said some of them are doing better than others. The layoffs are certainly -- they are actually part of the layoffs and we see that in less usage of our software in some of these companies. What we've learned is that these companies manage to a two-year backlog and they do that by throttling their headcount.

Some E&Cs are doing better than others because of how they were positioned before this downturn. The ones that are facing refining and chemical they are actually well and buying more entitlement from Aspen Tech, their focus is on cost estimation and project execution.

There's cancellations and reductions that we see in spend, but at the same time through the usage logs that we get from these customers we also see that there is some Tier 1 companies that are still experiencing denials of service, meaning they don't have enough token for the amount of usage that they need of our software. And of course that intensity of usage have come down in the last 12 months but we still see those denials of service, but very cautious, a lot of caution by these customers around spending.

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When will the trough of the market be for E&Cs and I get asked that question. Well, my simple answer to that is when the oil companies start spending more. And when that happens then you'll see a lag and then the E&Cs will start hiring more people.

On the chemical side it's mostly a lot of positive dynamics. Again, I've mentioned most of these positive GDP direct demand increase, the feedstock advantage in the US from shale gas and investment that's coming into the US, the shift towards specialty chemicals, operational excellence, and we're seeing a lot of M&A activity in the chemical space. We normally see that as a benefit when we see M&A activity because it gives us an opportunity to engage those customers in a discussion around our contracts, and normally there's a cross-pollination that takes place when two companies come together that leads to greater usage of our software.

So these are the dynamics that we normally see and we're seeing in this business environment. We've given you this information in the past, perhaps a little bit more granular, but about 38%, 40% of our business is energy and it's played on a 60, 30, 10 basis. About 31% is E&C and 26% chemicals, the other 5% is a list of these industries, pharmaceuticals, metals and mining, power and utilities and so on. And that's how our business is distributed. It takes a lot to change those splits because it's against a revenue base at the beginning of the year of about \$420 million. So a single year of performance doesn't necessarily change these numbers a whole lot.

So why do customers choose Aspen Tech? I think a lot has to do with the deep domain knowledge and expertise that we have in hydrocarbon processes. Of course the large and measurable return on investment.

We solve complex optimization problems and that's what they deal with every day, the breadth of our solutions. And I would say if we want to be known as something to these customers is as domain experts, not only because of the software but the knowledge and expertise that's embedded in the software, but also our understanding of the industry's best practices, the value that we create, the bench-marking that we can do of one company against their peers. So there's a lot that we can bring to the table and over the 35 years it's not only about our products but also how we can present those products to them as well.

These are some examples of how we create value and there's thousands of these examples, this is just six of them. And in Petrofac, a stabilizer column in an oil field was receiving crude oil that was heavier than the design called for, there were limitations to this. And through the use of HYSYS an analysis was done to determine whether the bottleneck in the stabilizer column was going to be resolved by increasing the temperature or reducing the pressure. It turned out that it was through the reduction in pressure, and that saved this customer about \$4.8 million.

And you see those examples, LG Chem, they wanted to double the capacity of a solvent recovery unit in a petrochemical plant, but also reduce the energy consumption, through the use of our Aspen Plus and Aspen design rating tool, not only did it double the capacity but they say 40% of energy from the initial basis, [momentive] through the use of our plant scale and technology in 70 plants around the world.

And standardizing the technology integrated to SAP were able to improve their customer service by 35%, but also increase their on-time order fulfillment through their customers by 12%. So it's not only value creation but also productivity. Improvement, the same thing at Samsung, Reliance and many of these other customers. Last year during the Optimize Conference we talked about Aspen Tech and our products creating about \$50 billion per year of value. We've gone back and looked at that number and we're ever more convinced that it's at least \$50 billion of value that gets created from the use of our technologies on a yearly basis.

If you go back to the example I gave you about ExxonMobil, they're heavy users of our technology, 5.3 million barrels of refining capacity a day, saving 1% on their crude oil purchases is a \$1 billion alone, and that's just from our planning tool. So if you all up all these together we can come up with that number and more.

And then finally these are two solution suites, our product suites, our engineering suite that represents 70% of our software revenue. And our manufacturer and supply chain suite that represent about 30% of our software revenue. And this is information that we've also given you in the past.

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So let's move on to strategy. And we introduced our strategy last year also during Optimize 2015 right at the beginning of my presentation in the plenary session. Our strategy is one of asset optimization. We believe that asset optimization is the future of optimization. It will transcend the functional silos that you find in a plant design operations and maintenance. We believe that in the future customers will be focusing in the entire asset life cycle and how to optimize the asset from an asset life cycle standpoint.

When you hear E&Cs talk about brownfield and focusing on brownfield operations it's really about the maintenance of those assets. How to optimize the maintenance of those assets we believe that by evolving our scope of execution from design and operations into maintenance will become that much more relevant for owner operators. It will be a holistic approach and we'll build on the 30 years of expertise, 30, 35 years of expertise that we've created.

And if you look at Aspen Tech there has been two distinct phases to the company. You could argue that the project in MIT was also a phase. The company started as a modeling and simulation company of one product. Eventually it made an acquisition that moved it into dynamic simulation from a steady state. It has two products. But then in the mid '90s it began to consolidate the advanced automation space and between 1994 and 2002 it made 23 acquisitions. That moved the company from modeling and simulation into process optimization it's what we are today.

I would argue that the process optimization phase is taking longer than you would have imagined because of the turnaround that the company went through in the mid-2000s, 2005 to 2010 or so.

The opportunity exists for us to evolve the company into asset optimization and continue to leverage the huge opportunity that still exists for us in the design and operation space into the maintenance. It will expand the TAM, it will expand the opportunity for us in refining and chemical, and any other asset that we may decide to go and focus on.

So we consider this to be a significant opportunity going forward. We are particularly excited about this opportunity. Certainly if you view Aspen Tech, we're the global leaders and the design operations of these assets, it would require us to extend ourselves into the maintenance space.

The thing about the maintenance space is that it's not a space that it stands alone by itself, it's a maintenance space that is tightly integrated with operations where Aspen Technology is today and with the design of these assets. Our view is that going forward when these assets are designed we can make sure that in those designs not only we're taking into account the capital costs or the capital effusion of building those plants and how they're going to be optimized from an operational standpoint but how we can also optimize them from a maintenance standpoint taking into account the reliability, maintainability and operability of those assets into the design.

We can also look at how these assets are planned and how the design is done to take into account the full range of potential operations of that plant in different business environments but also in different economic environments as well.

And then from an operations and maintenance standpoint this is an area with few companies - and it's a very fragmented space. You see a lot of small software companies doing pieces of the work in the maintenance space. We believe the combination of optimizing operations with the maintenance, looking at the root cause analysis, looking at the reliability of those assets and how they can be operated in a way that extends the lifespan of equipment in those assets will lead to more optimum decisions in the future.

Certainly the goal is to anticipate asset life cycle, extend the life cycle of those assets, make those assets more profitable across business cycles, not just one scenario and optimize that with operations, with objective two, maximize the return on capital, minimize the risk, mitigate risk from the operation of these assets while sustaining competitive advantage over their full asset life cycle.

We are already working on this. And I will give you a few more details here.

Now what does that mean for Aspen Tech? Well, we want to expand the depth of what we do. Today we're very focused on what's processed in these assets. We want to be focused on not only what's processed but on the equipment that is processing that feedstock, that crude oil or that ethylene to turn it to polymers. What are the issues that are impacting the equipment that lead to the gradation of operations? So it's not only about how do we better fractionate the crude oil, but how do we mitigate the issues that are impacting the equipment?

We want to expand the scope of our solutions and we want to go not only would we want to be focused on the unit and the process and that's been our 35 years so far, but we want to expand that scope to the full plant, to the site. So over the last five years we've made acquisitions that have actually started to push us into the boundaries of these assets. We've made acquisitions in the safety area. We made acquisitions in the environmental area. We bought a dock and scheduling solution that moved us into the off-sites of these plants.

So there's a much bigger opportunity when you focus on the asset of the site of the plant as opposed to just the process unit. And then we want to expand our activities. As I just mentioned we want to go from the design, the plan, and operate into the design, plan, operate and maintain. So we'll bring with us our history and the success that we have and in a way this is the way to create more runway, TAM expansion and continue to grow the company going forward.

If you think about what we are to date on the design space, if you think of any customer when someone says, well, we are going to find a way to better manufacture this product, or we are going to create a new product because a customer is asking for a different type of products specification they start with our products.

Our products they are using in the R&D department but they are also used to come up with those designs that don't exist today, that is sort of the conceptualization of these products or designs, but when then we move into the basic engineering, once those designs are approved and then we worked in laying out how that plant is going to look, the different pieces of equipment, the sizing of that equipment, the interiors of the different equipment, but also how much is going to cost to build that plant or that refinery.

Once that's all completed then that moves into the detail engineering. We do some detail engineering work for Shell and tube mechanical heat exchangers, but most of the detail engineering work is in passed onto to companies like Aviva, Hexagon, Intergraph, Bentley, they do the detail engineering for this plant.

Once these plants are built then Aspen Tech comes around and those models that we built during the conceptualization and basic engineering are used online. They are used to do studies, the bottlenecking studies; they are used to do analysis on these assets to understand perhaps why a plant is not processes in as much as it was designed to do to perhaps understand why the product qualities that were designed for plant are not being met.

Those are all studies that are done when these plants are operating, to, again, optimize our operations and are using the models that the engineering firms created when they designed these plants. So that's what we do in the asset design, the aspenONE engineering suite.

In the asset operations similarly, you may have a refiner with six or seven refineries. They decide they want to build another refiner. Well, that starts with a study, the strategic planning study using our planning tool to identify what is the best location for that plant, for that refinery or that chemical asset. What are going to be the feedstocks and what are going to be the products that it has to produce?

And once that is decided, our tool, our multi-planning tool, multi-plant planning tool is used to determine the optimization, what refiners or what chemical plants it should produce for what market, and what products?

Once the plants are operating, well, the day to day planning is done with our planning tools, then once you create a plan you would create a schedule of how you're going to execute that planning and the refineries on the chemical plants that's done with our tools.

All the data that those plants are generating, or temperatures or pressures that's all being captured by our real time that is a management software IP 21.

If it's a pharmaceutical company, well, they're using Aspen production Record Manager to track exactly what happened to that product along the production process, FDA requirements for example. But also customers want to understand the material balance from a production accounting standpoint.

Believe it or not in some parts of the world stuff gets stolen before it gets to the end of a plant in the production process. So you want to do of what went in and what came out to see what are your losses and understand if you have leakage in the plant. We do that as well.

And eventually we have our control software, our optimization software that sits on top of this plant to optimize operation and make them produce what they have to produce as optimally as possible by consuming the least amount of energy by processing as much as possible to produce what's required. That's our Aspen manufacturing suite at a high level.

We're saying that we believe there's an opportunity to take all that, leverage our design and operations expertise, our products and solution, and move them and leveraging them into the maintenance space.

We've announced that we've been working on an Analytics solution because over 35 years we've become a platform for our customers. A lot of the data, the models and the information that our customers have and used in their assets it's in our products.

So we believe we can leverage that know-how, that access to all that information to create a set of analytics that is not only data analytics but the leverage is an empirical representation of those assets in our engineering models, and bringing the predictive capability of models with the analysis of that data to create predictive and prescriptive analytics for our customers and you'll hear more about that from both Suresh and Josh later today.

And once you do analytics you want to be able to understand well what are the equipment anomalies, what's impacting that -- what are the issues with equipment and what's impacting that equipment, what is it that's happening in the upstream of the process that's leading to these issues?

Do a root cause analysis and understand how you can improve the reliability of those assets and this is what we believe we can do in asset maintenance by extending ourselves. It will require some organic development. It will require some acquisitions but it will leverage our entire suite of products and solutions that we have today. And we're very excited about this.

So that's our strategy. In a way it's an evolution. It's not a drastic step change. It's leveraging what we have today into the maintenance space and complementing that with some development and acquisitions that we are focused on today.

It will leverage the same expertise and know-how we have about these assets as well. So let's talk about quickly how we go about this. In the past you've seen this slide, the same headers. We've added one around that Aspen Tech ecosystem. We believe as we try to grow the company we want to have other third-parties out there helping us drive more of our products into the market.

But let's talk about product innovation. And I will touch on it at a high level. I know both Josh and Suresh will do a deep dive on this, but again our product innovation will continue to focus on what we do today. And the design and operations of this asset, and we'll extend ourselves into the maintenance space.

We want to make sure that our products are faster and easier to implement. Our customers are telling that and we're focused on that area. We want to make sure that they are secure to be accessed anytime from anywhere and we simplify the user experience and we believe that one way to do that is through automation of knowledge work that is encapsulating the knowledge that it takes to use our product in the software so that that knowledge no longer requires - it's a click of a button and that analysis is done.

We've talked about activation and you're going to hear about that as well. It's prescriptive analytics. We don't want our analytics solution to be a major project for our customers. We want it to be what I told the team to be, a slap-on

analytics. You install them, a little bit of configuration and you're on with analytics, and other areas where both Josh also will elaborate.

So our focus is on product innovation, last week we announced the release of our V9 version and Suresh is going to go in detail into this. But two things to highlight specifically, our blow-down technology acquisition is now had been released in the release last week.

We are the only company, blow-down was the standard technology in the world for de-pressurization analysis. We bought the technology and we are now the only simulation and modeling company in the world that has this technology.

Significant differentiator and Sulsim, we bought the technology also from the company Sulsim. And it's now in our HYSYS product. It will allow our customers to model sulfur recovery units, predict sulfur emission and it was a gap that we had in our modeling technology and now it's filled.

But there was also a lot of other innovation that was released in V9 and you'll hear more about that some more later.

I will talk a little bit about prescriptive analytics because this is something that we're very excited about. We're now in the beta phase of this development. The customers that are working with us are excited about what they are seeing. Some of them have already asked to take the software and start working with it in their own operations.

So like I said it's not only about data, it's about the ability to predict what's going to cause a problem and prescribe solutions to avoid that problem going forward. It's about bringing models and data together which is a big differentiator from a lot of other companies in the market where they just talk about data.

And there's a lot of companies out there that do not have the vertical industry expertise to give context to that data. We believe that the key different for Aspen Tech in analytics and the use of models is also the vertical industry context that we can give that data to make it meaningful and create value.

Our initial focus is on equipment and Josh will talk about the equipment that we are going to start to focus on, and then the many other pieces of equipment in units. But we're focusing on equipment that are common around the world that represents in some case hundreds of thousands of these pieces of equipment where if you do analytics on each of them and you avoid the problems that they demonstrate can mean hundreds of thousands or millions of dollars in savings for our customers. And this is only through the combination of models and data.

But it's also more than that because in a way the vision that was originally laid out for Aspen Technology 25 years ago by the founder of the company is coming about. By consolidating this space we ended up with our unique set of asset technologies.

The vision was that at some point you can bring all of these together to bear, to create huge value for our customers. So what I've already said about data which comes through our Info-Plus 21 product and models which can HYSYS and Aspen Plus their solution will also eventually be able to leverage our advanced process control as solution for example.

It will be able to leverage some of our new search and pattern recognition capabilities that we've developed in the company, some of the data that exist in our cost estimation tools and our planning tools. So it will start leveraging all the solutions in the maintenance space to create huge value for our customers.

So we are incredibly excited. I think we're at the beginning of a new phase for the company and there's been tremendous work that's gone into this and you'll hear some more about it in a little while.

So penetrating the customer base this is a question that I get asked from a lot of you. Well, what does that mean? Well, as what I've normally said it's going deeper into with our customers, more users of the same product, and more users using different products. But it's not only that it's providing the educational content so that these users understand the value that they can create.

It's also talking to them about and perhaps not necessarily the users but their managers and executives about bench-marking. How do they benchmark from a usage standpoint of our products versus other companies? And we've done that with many customers.

And the reaction is an unbelievable reaction when they see themselves bench-marked, again, to other customers and they start asking questions about, well, why is this customer using more technology than us? What's the reason?

They want to know why they are not where some other competitors are. We talked to them about best practices and over the last 18 months we have started to talk to them about, you know, where are they in the maturity model to achieve those best practices? And they get very interested when, you know, if you're talking about a scale of 1 to 4 and maybe they're at level 2, well, what's going to take to get to 4? How much more software usage and how much better do we need to get on the use of our technology?

So penetrating the customer base it takes many directions and approaches. One at the user level but also mid-level managers and executives and we're trying to just get more granular on how we're approaching these customers to generate more usage.

Investing in emerging markets, this has been one of our initiatives over the last few years. Certainly with the changes in the oil landscape we've taken a step back. Now we do think China is still a tremendous opportunity and we continue to invest in China today.

Latin America certainly is a region that is facing a lot of challenges at the moment, is a natural resources-based economy down there for the most part. And those are the challenges that they are having, but we continue to execute in Latin America.

The Middle East will account and is accounting already for almost 25% of the refining capacity in the world, almost 20%, 25% of the chemicals capacity in the world, and we'll continue to invest in that region.

Russia perhaps has been one of the most exciting surprises in this downturn because despite everything that is impacting Russia they've continued to invest every quarter on technology. I've said it before from a technology adoptions standpoint they felt to me like they were sort of in the late '90s, but into the late '90s in the US and they continue to adopt a lot more technology from Aspen Tech.

And the SMB in this downturn certainly was the first one impacted. It delivered positive growth last quarter. And we've taken this opportunity to look at how we've optimized that organization but we're committed very much to continue to drive our sales through SMBs.

From a digital channel standpoint what I'll say though it's a few hundred companies that represent 80% of our revenue but it's hundreds of thousands of users, and we want to get to them regularly with content, educational content, training, and the only way to do that is digitally. We cannot do that face to face.

So we've been working on putting in place a platform to deliver content to these users on a regular basis and we're well down that path. We're already starting to see the results but it's one of the areas that we continue to invest and will invest in FY '17.

It requires multiple channels of engagement not only at webinars but also mobile communities, and all sorts of stuff, but we're very excited about the opportunity that this will represent for us.

Pursuing acquisitions, [well], it's an effective way to drive shareholder value and we've done five since 2012. We continue to press the flesh to see what we can do in that area. We have a pipeline of acquisitions, most of them tuck-ins. And, you know, we're hopeful that some of them will happen in the future.

I get the question, well, are there any medium or large-sized acquisitions? You know, when we think of acquisitions we think of them in the context of can they support our long-term profitability target and our growth aspirations.

And when you put that filter on acquisitions you end up with a very few of them if you're looking at medium or large size. Nonetheless I would say in the category of bigger than small -- and in the small and medium range there's probably one or two acquisitions out there. And, you know, we look at those companies but our announcement of our buyback plan for FY '17 should signal to you that we don't think it's something that is that imminent in the future. But we're continuously evaluating opportunities.

Expanding the total addressable market and this a metric that we started to give two years ago and you're going to get an update here. We do believe we have a unique TAM and that we can calculate the TAM and I will give you first of all the methodology that we used for those of you that were not around in the last couple of years.

Our TAM was originally focused on our top 350 accounts. Last year I mentioned we noticed a gap in our TAM calculation and that our TAM was based on estimating that the TAM for the top 350 accounts and then extrapolating it to the other 20% of our business which we assumed was SMB.

As we got into it last year we noticed that there was a group of accounts in this emerging regions that were not yet in our top 350 but they were not SMB. These are big customers in the Middle East, in Latin America, in Russia, in China and other places, until we decided to go back this year and look at those accounts.

And we added about 150 accounts to our TAM calculation. That means that we've developed a new TAM number for an additional 150 accounts in our calculation. The TAM is estimated based on both the white space and the installed base, by site and by product for each account.

So it's based on existing customers at the time we do the TAM and the existing products and functionality at the time we do the TAM. It's not about the future. It's about what we have today in front of us.

We do that for every site in every account. We estimate the white space and the installed base. We assign the number of tokens to those products for both the installed and the white space. We designate average dollar per token for those tokens.

We roll that number up for each account. And then we do it for all the accounts and that gives us a TAM number on a TLCV basis and an annual spend basis. And then we extrapolate it for the other 15% to 20% of the accounts that are SMB for which we do not do a manual estimate for the TAM.

So that's the methodology and the basis. The TAM is finished, the TAM calculation because also to give you a sense is completed by December of every year. The numbers are rolled up and calculated in the first three months of the year and then normally May and June, we give them to you.

So this is a number that reflects our TAM as of December 2015 and the functionality that existed at that point. So, we released V9 last week. The V9 functionality that was released still not in the TAM. The blow down and sourcing white space, for example, is not in the TAM.

Some of the impact from the downturn is in the TAM because some of these E&Cs had laid off employees, therefore there were less process engineers in some of these companies and the TAM is adjusted down in that case as well. So we account for the dynamics in the industry as well.

So, what drives TAM expansion? Well, industry growth, the organic industry growth and these growth projections are from IHS and Platt and ARC, I'm sorry. Their own projections for the expectations of the growth of this industry in 2016, 1% for energy, 3% to 4% for chemicals. No growth for engineering.

It also takes into account escalations, so we have price increases of 2% to 3% every year. The TAM expands from escalation as well. It expands through product innovations, adaptive process control, acid gas modeling, visualization and analytics, activation. When we release analytics that will be part of it and also acquisitions, which I just mentioned.

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So, these are all the things that expand the TAM on a regular basis, and really when we talk about industry growth, it's probably new refineries or new chemical plants or E&Cs, if they've hired more engineers or if they laid off more engineers.

So what are the numbers? These are the two numbers for '14 and '15. This is a 2016 number, about \$12.1 billion in TAM. The installed on a TLCV basis back in December was about \$2.1 billion.

We assign an equal number of tokens to the competitors' products and also an equal value to their tokens. To estimate that number is an approximation. We do know that they charge less than we do, so we're generous with the pricing, but certainly they don't sell on a token basis. So, it's just an approximation.

So our TAM -- the total TAM for 2016 is \$12.1 billion. The available, the white space TAM is \$7.9 billion on a TLCV basis. So what expands that TAM or what expanded that TAM in 2016 and new products and functionality that was released before December of last year, between January and December.

You are looking at version 8.8 in May of last year and version 8.9 in November, I believe, and the functionality that was released in those versions. You are looking at additional sites that we added when -- well, we now -- the one thing we've done as well is we've gone out and gotten better data, market data about each of these customers.

We've bought some databases and now we know we are missing some sites in our top 350 accounts. And then we added these additional 150 accounts to the TAM. So that is the detailed analysis for the TAM expansion that you see.

The other thing that we've done this year, is we've converted the TAM number from TLCV to annual spend, because going forward, the metric is annual spend, so on an annual spend basis, this is the metric, is at \$2.61 billion in TAM on an annual spend basis. And the available TAM on an annual spend basis is about \$1.77 billion as of December of this year.

So, this is the number for 2016 and again, a year from now we'll update it again. And this is the value of the functionality in an annual spend basis as well, just a conversion from the numbers that you saw earlier.

So in addition, we have five years business plans for every one of our major products. In a way, we know what we're going to do with our products five years out, especially over the next two, three years.

We understand the business impact that the development work will involve. We understand the TAM creation from those product roadmaps. So in a way, we have visibility as we release this functionality about how our TAM is going to expand over the next five years.

And based on the reviews that took place in February and March of our business plans, we have a very good idea of how our TAM will continue to expand. This is just to give you a sense that it's not something that it's happenstance. We have an internal goal of expanding this TAM every year by a certain percentage and that's baked into our product plans and our product roadmap.

So here, coming to conclusion, talking about the Aspen Tech ecosystem and this is a new slide. We've had a channels organization in place for many years now. The channels organization represents less than 5% of our business. And we're going to be focused on cultivating third-party relationships to continue to drive more of our products and solutions into the market and expand our business outside of our core industries through third-parties.

We're going to be focused on establishing partnerships with industry players to drive Aspen Tech products into the market. There are some industrial companies that find themselves not able to compete with other industrial companies that compete with Aspen Tech. And they are interested in leveraging our products and solutions and include them in their solutions and take them to market. For example, there's also other consulting companies that are interested in creating business out of implementation of our solutions and be actively involved in promoting and driving our solutions in the market.

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We have an ecosystem of implementation service partners and actually it is a sizeable ecosystem. And we're going to be focusing on expanding that ecosystem as well, so that that capability to implement our solutions is more and more for our customers.

And then like I said, with analytics we believe there's an opportunity for **Aspen** Tech to become a platform for a lot of these E&C companies to leverage our solutions and products, to provide services to their customers in brownfield operations. So, this is all part of the development of an ecosystem that we're focused on and will drive it forward as appropriate.

So, to close here, what are the areas in FY17 where we're planning incremental investment, considering that FY16 has been a year of low growth, and particularly at this time of the calendar year, the business environment hasn't changed that much.

So we'll continue to focus on research and development. Expanding the core functionality of our products. Certainly, we believe we need to invest in specialty chemicals and round out our solutions in that area so as to make ourselves much more relevant for a lot of these chemical customers that are moving up the ladder into from bulk chemicals into specialty chemicals.

We're investing in analytics and what's going to be required to deliver an analytic solution and also an asset maintenance solution and that, of course, is organic development, but also M&A. As part of our dealer marketing strategy, we're putting in place a marketing platform, which is part of our information systems, but we're also continuing to upgrade our information systems going forward in order to scale and support the ability to scale the company in the future years.

So those are the areas of investment that we've identified for 2017. And in closing, I hope what's come across in my presentation is that despite this downturn, **Aspen** Tech has both the financial strength and the product and solution strength and the strategy to continue to drive the company going forward.

And eventually, again, our aspiration is to get back to being a double-digit grower in the future. We're working on the things that we believe will position ourselves to achieve that status and maintain the discipline in our execution around profitability and how we return capital to shareholders.

So, with that, I conclude my presentation. And I want to introduce Josh Fredberg, who will take the next session. Thank you.

JOSH FREDBERG, SVP OF PRODUCTS AND MARKETING, **ASPEN** TECHNOLOGY: Thank you, Antonio. Good afternoon. My name is Josh Fredberg. I'm responsible for the products organization, so product strategy and product roadmap across all of our products. And I'm also responsible for our marketing organization.

This afternoon, we're going to do something a little bit different. We're going to talk about innovation at the next level of detail. We're going to start with a first chapter that talks about our products as of today, as of V9, which we released just a couple of weeks ago. And I hope what you take away from this presentation is how our customers actually use our products and the connectivity across our portfolio.

We really have more of a system than a loose collection of products. So I hope you have an appreciation from that - of that as we walk through these stories and then finally, the value that's delivered to our customers.

We're going to take a break after that and then we're going to talk about the future. What are we going to do to substantiate this asset optimization strategy? So what is our roadmap? And give you a little bit more insight into the specific investments that we're making to make this vision a reality.

But we're going to start with today. I'm going to introduce Suresh next. Suresh is part of my team. And he's going to walk you through our portfolio today and then we'll have a break after that.

SURESH SUNDARAM, SVP OF PRODUCTS AND MARKET STRATEGY, **ASPEN** TECHNOLOGY: Thank you, Josh. Can you all hear me back there? Excellent.

So, I'm going to talk about the aspenONE product suite. So there are three things that I want you to remember. The first is that in this next session, I'm going to do a deeper dive into our products as they are today.

And I'm hoping to show you how the different elements of our engineering suite and our manufacturing and supply chain suite come together in an integrated manner to address customers' business challenges.

The second point is that we released version nine of our software last week, a week ago yesterday. And this version has a number of new innovations in it. And they build upon a number of other innovations that we have delivered in the preceding few years. So, I'm hoping to show you a preview or an insight into all of those new innovations that we have delivered over the past few years.

And the third point I want to remember is that there's a significant opportunity in front of us. There's opportunity for our customers to migrate from older versions of the technology to newer versions, so they can take advantage of all the new innovations. And that also represent significant opportunity for Aspen Tech, both from the increased token consumption that comes from the new innovations, but also because these new innovations can be used to solve a broader range of problems. So those are the three things that I hope to bring out in this next session.

So, first, let's talk about what is the problem we're trying to solve? It's an optimization problem, right? We are trying to make sure that our customers are optimizing the allocation of their capital and their resources.

It's not a simple optimization of just profit. Instead, they are looking at multiple, sometimes competing objectives. That we want to make sure that they are deploying the capital efficiently. They are being efficient in their use of energy. We want to facilitate productivity and innovation. We want to maximize yields. And we want to make sure that we design and operate these facilities such that they can be controlled, that they operate in a safe manner and with the minimum possible impact on the environment.

So these are complex sort of challenges. And our customers are looking for someone like Aspen Tech who has a technology breadth and depth to address all of these challenges simultaneously. And we are the only company on the planet that can do this.

To illustrate and show you what our technology can do, I'm going to tell you a story. And this story is going to focus on a specific vertical, the energy vertical. And, in fact, I'm going to focus on the refining sub-vertical of energy. And tell you the story in terms of what happens in a refinery. What are the business challenges that our customers face? And how those business challenges can be addressed using our technology.

The same story could be told for other verticals, but I think you will get the idea if I just pick one. In this presentation I'm going to show you several product screenshots. I don't think anybody here is a user of our technology.

But I thought you could at least get a feel for what the product looks like by looking at screen shots of the product. So to start with, let's just talk a little bit about what is happening in the energy vertical, very specific to refining. And this is picking up some of the points that Antonio already mentioned.

So the first is there's a lot more crudes available in the market, right? The graph on the right-hand side shows that just in the OPEC crude basket, the number of crudes that are available between 2004 and 2015, there's been a significant increase.

There's also, as you know, the U.S. ban on crude exports has been lifted, so there's even more crudes available in the market, outside of the OPEC crude basket. So refiners are having to evaluate multiple crudes and make sure that they are selecting the right crudes to process in their refineries. That represents an opportunity for Aspen Tech.

It's not just that the number of crudes that are available are increasing, but the characteristic of the crudes are also different. You've probably heard of light oil and heavy oil, you all have heard of sour and sweet. So the mix of crude is also different. So a simple change that a refinery can do when they are processing lighter crude instead of heavier crude is to increase the capacity of the equipment and that drives on average a 1.5% increase in capacity.

But if they are sophisticated enough to actually be able to process blended crudes, they can drive a lot more capacity. And our technology allows them to do that.

Number three, as Antonio mentioned, refining companies have had operational excellence initiatives for a number of years. The graph on the right shows what Valero has been doing since 2008, where every year, they are measuring the performance of all of their refineries against very specific indices that they measure, such as mechanical availability, energy intensity and so on. And so, these guys are looking for optimization software because that is the way that they can improve the operational excellence of their units and their sites.

And then finally, we're talking about the demographic challenge, especially in this downturn as companies are reducing workforce. A lot of senior, more experienced engineers are leaving the workforce. Newer, less experienced engineers are coming into the workforce and, of course, there are two sets of challenges or opportunities this creates. One is the opportunity to embed knowledge and package them in such a way that you can deliver them to the end-user, so that they don't have to be an expert.

And the second is the ability to create new user experiences, because the younger audience, of course, demands a different user experience in what their older peers might have. So these four strategies, kind of, inform our product strategy throughout. And as you will see, we have included many of these elements in our products.

So Antonio mentioned about our two product suites the engineering product suite and the manufacturing supply chain product suite, so I go through my story, I will be picking up elements from each of our product suites and showing how they are used to satisfy and solve business problems.

So imagine that we are talking about a refinery. So the refinery business challenges can be grouped into four major business processes; plan and schedule, engineering, process control and manufacturing execution.

And I'm going to come back to this graph on a periodic basis. So in the beginning, what's happening is a refinery is trying to decide what crudes of all the crudes that are available in the market, they should purchase and process in their refinery. Once they have made their decision, how should they plan their refinery. And once they have their plan, what should the schedule look like to operationalize the plan. So that's the planning and scheduling function.

The engineering function comes in because now they're saying, while the planner has picked a certain set of crudes to process, what impact does it have on my refinery? Is my refinery going to be able to process it? Should I make any changes to my refinery to do it better? How much is it going to cost? Is it going to be safe? What's the environmental impact going to be?

So all of these fall into domain of engineering. The process control folks come in because they'll say, OK, the planner and the scheduler say this is what they want to run in the refinery. How do I control my refinery so that it actually does what they want it to do. More than that, can I push my refinery to its limits to get the most I can out of all the equipment that I have in the refinery?

And then finally, manufacturing execution is about making sure that the refinery is doing what it's supposed to. It's about monitoring the refinery, monitoring all the different equipment. It's checking to see whether the equipment is as effective as you think it ought to be and getting other insights about the refinery that you might feed back to your engineering division, your planning division, or your control division and say these are some things that you could do better.

So let's start with our first one, planning and scheduling. So here we're trying to figure out first what crudes to select. And as I said before, there's a lot more crudes available in the market and there's a lot of different types of crude available in the market.

So in order to make the decision of what crudes to purchase, you have to know how the crude is actually going to perform. And in order to do that, you have to know the characteristic of the crude and that is described using what is called an Assay.

So the Assay, which is the colored vertical bars there, basically tell you for each crude, what are the different fractions that you can expect such as gasoline and diesel, jet fuel and so on. So it gives you an idea of what you will be able to make from that crude when you process it through a refinery.

Aspen Tech has a technology called **Aspen** Assay Manager, which has the data or the assays for over 700 different crudes that are available in the market today, but more importantly we have actually a proprietary algorithm, which is based on molecular modeling that can predict the characteristic of a new crude that be new to refinery and new in the market.

So when a planner is trying to decide what crudes to process, typically, they are looking at anywhere from 20 to 50 to a 100, maybe even 200 different crudes. And they have to run multiple scenarios against the crude because they have to decide, well, what if certain pieces of equipment is not available?

What if the prices change? What if the product demand changes because of seasonality? So they run multiple scenarios. So the planner is typically running an optimization problem where they are looking at multiple crudes and multiple scenarios. And for each one of those combinations, they are trying to solve an optimization problem.

It's a very complex problem and we have a technology called **Aspen** PIMS or Advanced Optimizer. That is the best that's out there in the market that's guaranteed to get you as close to the global optimal solution as possible.

Now, you can imagine that running these cases is actually quite compute-intensive, right? Just in a simple case of 20 crudes and 30 scenarios, that's 600 different cases. They can take hours to run. In the extreme cases of 100 plus crudes and multiple scenarios, you can take days.

So what we have been able to do is to enable our technology to run our multi-core processors and high performance computing machines and several of our advance customers and actually running many cases, 24/7, so that they are always picking the best crude that's available in the market. And now remember, as Antonio said, millions of dollars can be made or lost in making decisions on which crude to purchase. And our technology is very good at doing that.

Now, once you have selected what crudes you are going to purchase, you have to do crude scheduling and you have to derive your operating plan for your refinery. And when deriving the operating plan, you have to take into account actual constraints in the equipment, what equipment is available today or next week. Planners are typically looking out a few weeks to maybe a couple of months out.

So they need to take into account what might happen in the refinery that will actually going to impact their plan. So our technology takes into account actual real constraints of things like pricing, equipment availability and so on, so they can derive a plan that's going to be most feasible to actually execute in real life.

Now, the **way** the planning model works is the planning model makes an assumption of how the refinery is actually going to perform. So they have these empirical models that encapsulate the performance of different units in the refinery and that's what they use to do the optimization.

Now, you can imagine that as a refinery is operating, changes occur, equipment degradation happens, the crude changes, there's changes in the weather that might impact the performance of the model. So the model that is being used by the planner is not in sync with what's actually happening in the plant. Now, they can update the model by doing studies in the plant and collecting the data and refitting the model to the plant, but that's expensive.

And here, we have a significant advantage because we have a product called **Aspen** HYSYS, which is a leader in simulation in the energy space that actually has first-principle models for all the refinery units in a plant. So using the actual first-principles model they can use that to update the planning model, so no need for doing plan studies and experiments and data gathering and so on. And what we have done in the last version that was announced last week is we have automated the update of the planning model with the regular simulation models. So very quickly, the plan can be updated and utilized by the planner.

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So once the planner has determined the operating plan for the refinery, as I said, they are looking at a few weeks to maybe a couple of months ahead of time. The scheduler has to come in and figure out how they're going to schedule the plant, right?

So the scheduler, imagine, is someone who comes in every morning. They have to see what happened in the previous day, especially what happened the previous night. Was there a tanker delivery that was supposed to happen that didn't happen? Was there a shipment that was supposed to happen that didn't happen? So they have to do the best they can with the schedule. So while the planner might say, I want to run the plan which is shown by the blue line, the scheduler is not able to achieve the blue line, right?

So they are -- they try to achieve as close possible, which is actually the black line. The scheduler is scheduling out one or two days. The operator is the one who is in the front line, actually, trying to make the schedule work. The operator has to deal with real time situations, so there may be an alert that they have to go and investigate them. Maybe a pump shutdown that they may have to do. So the actual is actually even different than what the scheduler intended.

So we have technology that allows you to see the plan versus the schedule versus the actual. And this gives them insight to go figure out what they need to change the close the gap between these three.

And finally, it's not enough that you looked at all their different crudes and you looked at what was available and you've selected what needs to be purchased. You have to make sure the crude is actually available.

So when you're scheduling your refinery, you need to make sure that the crude that you thought you were going to run is going to be available when you need it. A lot of crude is still delivered through ships, so we have capability in our scheduling product; dock scheduling, which is an acquisition that we made that takes into account dock availability, tanker capacity and so on. So the refinery scheduler can take the full refinery and the dock scheduling into consideration when they are doing collaborative scheduling.

So the opportunity here is significant. So we have computed the value that we have created for our customers. And our estimate is that we generate about \$6.8 billion in customer profit every year. About up to \$20 million a year in higher quality operational planning and tens of millions of dollars in optimal crude selection. If you look at the Aspen Tech opportunity though, out of the about 700 or so refineries that are out there, only 440 of them use our baseline planning product which is PIMS.

And out of those are only a 115 are using the advanced optimization product there that I mentioned before. And only 240 of the 700 sites use Aspen Petroleum Scheduler. So we have significant opportunity to both up-sell our PIMS customers and the PIMS-AO but also cross-sell between our PIMS customers and our scheduling customers.

We've also learned from analysis of our usage logs that PIMS users that start using the advanced optimization product, increase usage by about 20%, of course, PIMS-AO costs about two and a half times more tokens than PIMS, so the greater value that the customer gets also translates to value for us in terms of higher token consumption.

I want to give an example of a customer that has embraced our technology in this space and how they started with about 100 or so tokens back in 2010, when they converted to the aspenONE license. And you can see that over the past six years, they have been on a steady path of buying more and more tokens related to our petroleum scheduling product, our PIMS product, PIMS-AO product and there's another acronym there, MBO, which is a blend optimization product, which I didn't talk about, but is used for handling crude blends.

I'm next going to show you a video of a customer who uses PIMS-AO for crude selection. It's one of our Korean customers and because the audio is not exactly clear, there's subtitles as well, so hopefully you'll be able to follow it.

[Video]

UNIDENTIFIED SPEAKER: And that depends on market situation. Every time we have to consider the best feedstock in our plant and market situation. After introduced AO, PIMS-AO it dramatically decreased the time.

We do the main case study and find some different choice and it make really good decision.

[Video Ends]

SURESH SUNDARAM: Okay. That was a short clip. The next area we'll look at is engineering. And again, the problem here that we're trying to solve is how is my refinery going to do with this new crude the planner has decided to purchase. How much is it going to cost me? Is it going to be safe? What's the environmental impact? And so on.

So the first thing is that our planning software and our engineering software are integrated and the basis of integration is the Assay. So the same Assay technology that is used to characterize the crudes that is used in the planning software is also used in our engineering software. And so that makes it very easy for these two packages to talk to each other.

So what is the first problem they are looking to solve? Refineries are a complex thing, right? There are many pieces of equipment. There's complex interactions, there is recycles.

And what the process engineer wants to do is to say, if we process this type of crude into my refinery, what is going to happen? And, of course, here we have Aspen HYSYS, which we believe is a gold standard for process simulation in the energy space.

Aspen HYSYS together with the petroleum refining layered product and the full suite of refinery reactor models that we have, allows the process engineer to build a detailed model of individual equipment units, but also a full scale model of the entire refinery. And that's what allows them to get a quick understanding of what impact is a crude going to have at my refinery.

But it doesn't stop there. As I said before, it's not only about simulating the process in the refinery and trying to maximize profit. It's also about trying to understand what is my best utilization of energy? What is going to happen with my equipment? So what we have done is we have taken many other complex technologies for economics, for energy analysis, for equipment design and packaged them up and presented them to the user in a very simple dashboard panel right in the simulator.

So going back to what I said before about the change in demographics, so the user only has to worry about the bottom line impact of the decisions that they make. The very complex algorithms and IP that has gone in the calculation of these results is actually hidden and that is an example of automating knowledge work.

And with this kind of environment, it's not just a simulation environment, but a unified engineering environment that allows them to do everything related to a process from within the simulation tool.

So one of the things that they may be interested in looking at, specific pieces of equipment and the distillation column is a critical piece of equipment in a refinery. And if there's operational problems in the distillation column today, what happens is there's, kind of, a dance that needs to happen between the operator and the equipment vendor where they have to try and get the data on what's the equipment internals and the equipment characteristics and try and figure out why is my column not performing as they're supposed to.

What we have done in our new version that came out last week is we have enabled this hydraulics capability within our distillation columns, right within the software, so the process engineer can see that where I am operating, which is a red circle is outside of the feasible operating range that's shown by the shaded area within the two lines there.

So very quickly, they can understand here is where my column's feasible operating region is. Here is where it's actually operating and so these are the changes that I need to make in order to get my operation back within the feasible range.

Another issue that the process engineer deals with is environmental compliance risk. Now, you know that there's many crudes out there that are called heavy crudes. A heavy crude is a crude that's high in sulfur content. And sulfur is bad news both in terms of corrosivity on the equipment and also, it's not good for the environment.

So we have capabilities, a rigorous, again, going back to our roots of being able to mathematically model complex phenomenon, a rigorous rate-based distillation capability that allows a process engineer to specifically model what's going to happen with the sulfur and the acid that sulfur creates.

You can imagine that sulfur in the presence of water creates sulfuric acid, which is acid, it's not good for our equipment. So they can model what's going to happen and then figure out ways in which to remove the acid gas from the unit.

And we also talked about the acquisition of Sulsim. It's not enough to take the sulfur out of the units. You can't just release it into the atmosphere because it's a hazard. So what companies do is they have a sulfur recovery process, where they recover the sulfur and the recovered sulfur is actually used in fertilizer or it's actually even used to make sulfuric acid, which is used downstream.

So with the integration of Sulsim into the Aspen HYSYS, now our user can do the end-to-end modeling of the acid gas removal, the sulfur recovery and the tail gas, which is then recycled back into the process.

Moving on into safety. Another acquisition that we had was PSVPlus a couple of years ago, which allows a process engineer to make sure that the pressure relief system that they have designed is adequate and it can handle all the different pressure relief scenarios that they might encounter in the operation of the process.

Additionally, all their different vents that come out of the refinery, the vent streams can be collected up and sent into another simulator we have, which is a flare system simulator that allows you to make sure that your flare system is designed properly and you don't have unnecessary flaring of your gases from your refinery.

And finally, to talk about blowdown Let me just explain what blowdown is. In many of these refineries, you have high pressure vessels and high pressure pipelines. And sometimes you have to depressurize the system, either because of maintenance or because you are responding to an event like a fire or an emission event.

When you depressurize a high pressure system, the liquids inside the system cool down and what that means is that the walls of the vessel cool down. And if it cools down too much, those walls can crack and then you have a big problem on your hands.

So what these companies do is they use a very expensive material of construction for all these walls, which is very expensive. What Blowdown does is it allows you to simulate what's going to happen in a depressurization situation.

It tells you where the lower temperature is going to happen and where your vessels won't actually crack, so you only pick the expensive material of construction for those vessels. So that's the Blowdown product. Again, it's now integrated right into a simulator, so the process engineer can conduct depressurization strategies as a matter of course.

And then lastly, all this is great, but we want to know how much is it going to cost. And we have, of course, the market leading product, Aspen capital cost estimator. The same capital cost estimator algorithms can be used in a conceptual phase what Antonio called as conceptualization to get preliminary and relative cost of alternatives, also in the detailed phase when you're actually thinking about building the plant and you want detailed cost estimates of all your different pieces of equipment and ancillary equipment. So it's the one economic model that's used throughout the lifecycle.

So the value that we have created, we have estimated be about \$5 billion annually for just our energy customers and that comes from increased production, about 3% to 8%. Increased plant profit, about \$10 million to a \$100 million per plant. And specifically, also by reducing capital and energy intensity by 10% to 20%. Thinking about the Aspen Tech opportunity, we estimate that for engineering software, we have about 30,000 simulation users in

engineering, but only 4% of them are using what we would call all the capabilities of the unified engineering environment.

So we see a big opportunity in expanding the scope of the process engineers to move from pure simulation to actually unified engineering. And, of course, as they use that additional capabilities, it consumes a lot more tokens.

We also see the significant possibility for us in getting new users in capital cost estimation. I'm thinking about what's happening in the E&C market and the E&C companies wanting to get much better at bidding and estimating. It's an opportunity for us in cost estimation.

We see huge interest in our safety products. So we see a lot of potential to get new users in several of our new technologies that we have added over the past few years. And finally, we also see growth in many of our emerging markets, where they are just now getting on the technology adoption curve.

Another example of a customer, it's an APAC based energy company. As you can see that, again, this company has embraced our technology and from the conversion to the aspenONE license back in 2011, they have steadily increased the number of tokens and it just comes from adopting more pieces of the engineering portfolio and then just getting more users and getting the users to use more and more.

I have another customer video for you this time. It's Denis Westphalen from Nexen, a Canadian company.

[Video]

DENIS WESTPHALEN, NEXEN: Any new cost project costs a lot, especially when compared to other areas of the world. And we have to be very smart when we design a new process, when we design a new facility and again too like process simulation too helps us to very quickly compare different alternatives, compare different options and come up with the best solution that will give us the best bang for the buck.

It's nice to sit on the HYSIS flow sheet and access so many different tools on the same starting point, to start a rigorous heat exchange evaluation, from that same user interface to start an economic evaluation. To start the energy analysis. We now have to learn the new safety analysis that's very important to our operations because whatever we do, we can talk about the cost. We can talk about operational cost, but in the end of the day, safety is the most important topic. And we are very pleased that we can run those evaluations from the [highest] platform.

[Video Ends]

SURESH SUNDARAM: Okay. Now that we have done our planning and scheduling. And the engineering guys have said, "Okay, we know how to run this crude in our refinery. And here are some better ways to do it. This is how we're going to do it."

It now comes to the process control engineers are going to say, "Okay, how are am I going to take the schedule that the scheduler came up with and make sure that my plant can be controlled, so that it does what they want it to do. And then secondly, how can I push my plan to its limit?"

So here, again, we have a technology called Aspen DMC3, which is our adaptive process control technology, that is, kind of, the market leader in this space. And the first thing that needs to happen is that the scheduler, when they come up with your daily schedule, is really coming up with a target that all the equipment units need to adhere to.

And those targets can become set points in the control technology. And we have several customers that are actually already doing this, where they're taking the targets that are being set by the petroleum scheduling product and saying, "Okay, these are now one with the set points in my process control software, Aspen DMC3."

The way advanced process control works is you can think of it like the thermostat in your home, right? The thermostat measures the temperature in your room and depending on whether the temperature is higher or lower, it either kicks on or kicks off the heater or the air conditioning unit.

So that's a very simple, what is called single-loop controller. The technology in process plants is model predictive control. They are usually looking at multiple different variables and controlling multiple different things that can be controlled. So it's a very complex algorithm, which is again, encapsulated as a model, okay? So the guts of the control technology is a model that basically predicts what the unit is going to do if there are certain changes in some of the variables that affect that unit.

Now just like in the planning area, even here, as time goes on, the response of the equipment changes. The equipment degrades. The crude characteristics are different. The temperature is different. The weather is different, so that model is no longer accurate.

So the operator, instead of thinking that the model needs to be updated, basically feels, "Okay, this controller stopped working," so they shut the controller off. That means they are losing millions of dollars in value.

The solution to that, traditionally, has been update that model, but in order to update that model, they would have had to shut down the plant, conduct some, what they call step change studies and then update the model and then bring it all back online, which is very expensive.

And what Aspen Tech did is we introduced adaptive process control. And it's, in the last 30 years in this space in process control technologies, the most exciting thing that's really happened and when we told our academic advisory board that we have actually a product that can do adaptive process control, they were astounded, right?

So this technology is basically self-calibrating. As the controller is operating and as the process is running, it's a self-toning model because it detects minute changes in conditions in the variable and then measures how the equipment is responding and uses that data to keep the model constantly updated.

So the controller never has to go offline, significant value to customers. And what we have done new in our version that we released last week is we introduced this new technology, which we are calling our DMC3 builder, which is a single interface that a new user can use to actually build and deploy new controllers. They could be linear controllers, non-linear controllers, all types of different controllers can be quickly built and deployed from one single user interface.

So it's really our, again, an example of automating knowledge work. What might have required an expert process control engineer to be able to build and deploy a new controller, we are now putting it in the hands of non-expert users and we have several examples of customers that have actually done this and achieve record production levels in record amounts of time.

So with DMC3, we estimate that we generate about \$2.9 billion in value, just to the energy customers on an annual basis. That comes from the increased yields of about 1% to 2%, reduced energy intensity by at least 5% to 10%. And also increased throughput of 2% to 4%.

And if you think of the Aspen Tech opportunity, there's about -- we estimate just over 4,000 installations of DMCplus, which is the previous generation control technology in the energy vertical, of which only about 400 or 10% of them have upgraded to DMC3.

So there's an opportunity to upgrade the other 3,600 to DMC3. But the other thing is because we have made it so easy to deploy control technology, it's now worthwhile for our customers to deploy it on other units where previously it may have been too expensive to deploy because the value may not have been as high. Of course, DMC3 consumes more tokens, in this case about three times as many tokens as DMCplus.

Here's an example of a customer. A U.S.-based refining company that has embraced, actually across our portfolio in the manufacturing space. They keep purchasing our additional tokens. They started with about 350. They add tokens for APC, for planning and scheduling. For IP21, which is what I'm going to talk next, which is our data historian. And as you can see, they continue to purchase more and more tokens.

I have a video here as well.

[Video]

UNIDENTIFIED SPEAKER: We're an ethylene plant, so one of the areas that the DMC controllers that we have on site are very important is in the area of furnace optimization where we try to make sure we control the excess O₂s to the appropriate efficient limits and really, the DMC technology is the thing that enables us to do that very consistently.

Also, at the backend of the plant, it's important for us to get our product out to meet the customer specification, but we don't want to over purify that product or else then we are giving away a lot of energy as well.

So when we expect an operator to control the process, without DMC technology, they do a great job, but they do run significantly more conservatively, which is really giving away margin. Our experience is that you just can't push the plant to its identified asset constraints in any other way, really.

[Video Ends]

SURESH SUNDARAM: Okay. The final piece of the puzzle is now my plant is running. I have my plan. I have my schedule. The control guys have implemented the control strategies. I want to make sure it's doing what it's supposed to.

That's where our manufacturing execution technology comes in. And here, you're answering questions such as how do I monitor my plant performance? How effective is my equipment? And what additional insights can I get about my plant?

So here, really, the challenge is about monitoring what's happening in the plant in real time. And as I said before, it's a complex environment, but we have technology which is InfoPlus.21 or IP21, which is a real time data historian. And the visualization product called aspenONE Process Explorer that sits on top that allows an operator to have 24/7 view of what's going on in the plant. So they can make sure that the entire plant or very specific units are operating in the range that it's supposed to operate in.

And if it goes out of range, it can provide alerts to the operator. And it can also provide a lot of contextual information as to what might be happening that could explain that alert. There's also six sigma technology embedded, statistical process control, so that the users can evaluate how their equipment unit is doing and how far it is deviating from the optimal operating point.

It's a web-based technology. It runs on HTML5, so it's browser independent. It actually sits on top of any data historian, not just ours. One of the things you can do with the Process Explorer is understand their overall equipment effectiveness. This is important because -- my apologies there, so they not only have to know, you know, you can't assume that the equipment is available the entire time that that's there. Within the total time, there may be some time where it's shut down because it's a planned shutdown, there may be other time that it's shutdown because it's an unplanned plant shutdown, so the operator can really dig deep into what's really happening with my piece of equipment? What is unplanned and start getting into root causes of why is there an unplanned downtime and start taking corrective action.

We are in significant release of this, actually in August of last year. And what we have is spanking new graphics, it's got extremely fast search algorithms that can deal with years of data in a matter of milliseconds. And as I said before, it's a browser-independent technology that can be deployed very easily with a very low total cost of ownership. And it can be deployed on top of any historian. So here is an example of the value.

Now, you might say that the value ascribed to this just seems to be low, \$250 million compared to the other technologies. That's because what happens is most of the value that gets created from the use of this technology gets addressed by solving the problem with another piece of technology, so the value gets ascribed to that, right?

But we still can drive up to 3% production increase and a million dollars saved for each unexpected event that we can avoid. This is a technology that actually has the largest number of end users of all of our software, right, because it's an operator-used technology. It is used in operator stations and control rooms on a 24/7 basis.

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So just in the energy vertical, we see about 40,000 users who are still using our previous generation of our software, less than 10% of them use the new generation software, which is aspenONE Process Explorer.

We have certain analytics capabilities that we have introduced into the technology, less than 1% of the users are using this base level analytics capabilities. And using that actually consumes six times more tokens. So, again, significant opportunity for Aspen Tech to up-sell.

So here's an example a customer that's just, again, embraced our manufacturing supply chain suite, they started with about 550 tokens or so and they keep adding tokens for IP21 which is a data historian production record manager which is one of the products in that family. And they continue to grow and add tokens.

The last video is actually not quite a video but it's a...

[Video]

UNIDENTIFIED SPEAKER: We're very confident that we can get more value out of our existing Trends and Process graphics by bringing them together in the new aspenONE Process Explorer. aspenONE Process Explorer is fast and the HTML5-based architecture eliminates client-side installs reducing our Total Cost of Ownership. We plan for many of our users to start using it right away.

[Video Ends]

SURESH SUNDARAM: Okay. I'm now coming to the close. I just have a couple of more slides here. So, what we have tried to show on this slide is to show how our technology stacks up against two competitors; Honeywell and Schneider Electric. And what this table shows is I walked us through a workflow with business processes and within this business process, what is the specific workflow item and showed you how our technology is used to address the business challenge in each item of their workflow.

And you can see that we have a pretty broad set of technologies to address all of these challenges. And if you look across the other two columns without getting into the detail, you will see a lot of half filled or empty circles. So, really, we are the only company on this planet that has the technology that can address all of the end-to-end issues that are defining customer space. And the same story actually applies in all of the other verticals as well.

So, the question is how do we get this white space, right? So, the left hand side of this graph shows the white space in the energy vertical for our different product families. I don't show any numbers here but you can see the relative magnitude of the white space.

And the way to capture this white space is really either through up-selling or cross-selling. So, this white space is based on our existing customers with our existing technology. We're not talking about going after new customers or building new technology.

So, as an example, we have a lot of PIMS users who are still not using PIMS-AO so, a significant opportunity for us to up-sell and get all these PIMS customers to start using PIMS-AO. Same story in process control, we have a lot of customers using our DMC technology. Some of them are using an adaptive technology that we delivered as a component but the package solution of DMC3 is still used by just a fraction of our customers, so significant opportunity to up-sell.

And as you look at the top there, you can see that I added the blue circle for MES which has a very large user base but there's very little overlap between our customers for our different pieces of technology. So, as I just fill this out, you'll see that HYSYS, again, is used by a lot of our customers in the energy space but not all of them are using a planning software or a control software or an MES software. So, we have significant opportunity to also capture this white space by cross-selling. So, we have initiatives in place to make sure that we are capturing all of our up-sell and cross-sell opportunities.

Okay. So, that brings me to the end of my session here and I will turn it over to Antonio.

ANTONIO PIETRI: Yes. Thank you, Suresh. Great. Great job. Before we break, and it's a 30-minute break so until about 3:25, I want to introduce one more member of my executive team and that is Bill Griffin. Bill, if you could stand up, please.

Bill is our executive vice president of field operations. He is me two and a half years ago. He's got global sales, global services training and customer support. He joined us about six months ago. He joins us from Autodesk and we're very excited to have him. So, you'll have a chance to talk to him during the break as well so, 30-minute break. Thank you.

JOSH FREDBERG: Okay. We're going to get started again. Can everybody hear me okay?

UNIDENTIFIED SPEAKER: Yes.

UNIDENTIFIED SPEAKER: Yes.

JOSH FREDBERG: So, we are -- we're really excited about the opportunity that we have. Suresh talked to you about our portfolio today and if we didn't develop any technology, we have an exciting opportunity. But what we're planning going forward really gets us excited to wake up out of bed and come in to work.

I'm going to talk to you about futures so, this is a disclaimer. Anything that I say is giving you guidance about our plans but should not be interpreted as a commitment. Our plans do change over time.

Antonio talked to you about our asset optimization vision and he talked about three dimensions of that vision, in asset design, in asset operations and in asset maintenance and asset maintenance really being a new addition to our strategy. He showed you also this framework. I'm going to spend time using this framework to really flesh out how are we pursuing our strategy for asset optimization.

Antonio talked a lot about the demographics and that there is a retiring population that has a lot of knowhow. A lot of how we're investing in features and functions is building out what we see are future practices and baking them into the software.

And I'm going to talk about of the specifics. We've organized them into six specific themes all around automation of knowledge work, not just the way companies work today but the way we think companies will want to work in the future.

And then on the bottom of this chart, you see architecture. There are some architecture investments, investments in core technology that allow our software to be implemented faster and easier and to lower the cost of ownership making it accessible anywhere and secure. And then finally, the user experience.

I'm going to use this chart to kind of flesh out our strategy and we'll come back to this chapter by chapter. We're going to start with the architecture. So, let's talk about the user experience. What have we done already? Well, we've invested quite a bit already.

We've invested in a consistent look and feel in our technology, all the engineering applications have the same style, the same experience so that you know how to use one module, you know how to use another. We've done the same thing for our enterprise software.

We've integrated our products so, activation all the examples that Suresh talked about, about how you can use our software to estimate the cost, the cost to build new assets, the cost to maintain and operate those assets, energy consumption, activations around equipment rating so being able to size and rate assets right in the same environment.

But we can go much further and I'm going to talk to you about that. And then finally we've invested a lot to make our products democratized. What I mean by democratized is that you shouldn't have to know a lot to use our software and get value.

If you have a PhD in chemical engineering or if you are supply chain expert, that's great. But we want to be able to make new professionals, new to the workforce as productive as seasoned veterans. So, we've invested to make our software easy to use but also right through the software, you can get access to training and support.

All of that is available, we call it **Aspen** Exchange. But in the future, we can do much more. We're working on workflows and best practices that take personas through multiple different product sets and in particular I'm going to talk about in the planning and scheduling space we're re-architecting our products creating common data models so that the experience right down the value chain from planning to scheduling to advance process control become seamless.

We're also investing in this new class of software that we talked about around analytics not to be confused with the kinds of visualization analytics in our MES suite, this is a whole brand new third family that we'll be rolling out. So, in addition to engineering, in addition to manufacturing and operations, this is a third family around **Aspen** Asset Analytics and it leverages technology from our entire suite.

We're building in best practices. We spent a lot of **time** and energy especially over the last 18 months really understanding the **way** the **leading** companies work and taking their thought leaders and spending **time** with them to whiteboard the **way** they want to work and actually documenting that in terms of workflows, in terms of maturity models and we're spending more and more **time** with our customers actually thinking about the **way** they want to work as opposed to just talking to them about features and functions.

And all of this is manifesting itself into the software into all new role-based experiences so that given the role that you're in it becomes natural and intuitive to use the software. You shouldn't need intensive training to get started and to drive value.

Let's talk about security and access anywhere, anytime. Today, our portfolio is partially enabled on the web. Some of it is on the web. Some of it is traditional desktop. Some of it is traditional client server software.

Today, we've got a lot of experience with virtualization. So, many of our customers use virtualization we test and tune our software for a variety of different virtualized environments. We've invested in security. So, we're leveraging all kinds of industry standards like ISA99.

Security is incredibly important to our customers. Cyber security is an existential threat to these customers so, they want to know that we are **leading the way**, that our software is as secure as any software in the planet because there are safety issues, there are a variety of IP issues and it's at the heart of their business.

And then finally, we've done a lot of work around private clouds with our customers. Many customers are using our software already in their private clouds. What I mean by private clouds, this industry isn't ready at this point to go to a SaaS public cloud environment. The security issues are too intense and the safety issues are too intense.

But they do want to have elastic capacity for compute power. They do want to be able to get high performance computing when they need it and to take advantage of the Azure and the Amazon's price points for hardware. So, they want private clouds and they were already deploying our software in private clouds and we're working with them and learning together as we build new commercial offerings around private clouds.

But in the future, we're standardizing towards a web infrastructure. We're building out HTML5 across our entire portfolio. This will give us optionality. It'll allow us to have the ability to take our technology into web and mobile environments. We'll see what happens with the cloud environments. We'll be ready when our customers are ready. This gives us extensibility.

We're doing a lot of work around distributed computing. So, almost every module of our software has a high performance computing opportunity. What do I mean by high performance computing? I mean leveraging not just a single core for a single job but leveraging dozens, hundreds or thousands of cores to be able to run thousands of scenarios or to take a really complex job and solve it very quickly.

So, high performance computing is central to our strategy. It's central to the value we need to deliver to our customers. They need answers quickly. They need to be able to make trading decisions often based in minutes. They cannot afford days or weeks of compute time.

So, we're investing heavily, it's also a fantastic opportunity for us. We are now monetizing high performance computing. So, not only can we make money as more users use our software more often but we'll make money as they use it more intensively. We will tokenize their use of high performance computing.

This is a brand new commercial opportunity and extremely exciting and extremely differentiated. We're leading the way in terms of our high performance computing scalability.

Micro services and containers so, we're building out service environments where we can have services that are reused across our portfolio and we are getting very granular in those services so that there's lots of extensibility in our architecture. And we're doing it in a container environment.

I don't know if you guys have read about dockers and containers. But this is an architecture strategy that we are pursuing at this point. We believe that in the medium term, many customers are going to want to have a private cloud environment where they get to have elastic capacity for compute power but they want to control a little bit how the software is deployed.

They have environments that require testing and validation. They don't yet want to have a public cloud environment where overnight they come in and a new piece of software has been installed but at the same time, they want to lower their cost of ownership.

Containers can give us a way to give them a lower cost of ownership like you'd find in a SaaS model but give them much more control around the software that's deployed in their environment. And they want much more security.

So, we're building out the next layer of security where we're being very thoughtful with our customers about what information is being presented to which roles because that's an additional layer of security to make sure that the information is appropriate for that role.

Let's talk about faster and easier implementation. So, we've already improved our download center. So, in our download center now customers can download their software and some still choose to get their software distributed from us, we send them USBs. More and more we're finding that customers will choose to use our download center.

We've got all kinds of utilities that we built up for customers. We call it a Silent Install so they can download the software and customize scripts to be able to deploy the software in the way that they want to do it in their enterprise but also build automation and lower their cost of ownership.

For product updates, we built an update center so that they can log on and the software is smart enough to know what updates are relevant to that enterprise. We've invested in central license managers so, customers now have one central utility to manage their licenses and to look at their utilization of tokens and their usage.

And then finally, we've built out templates that are industry-specific that allow them to rapidly deploy our software using scripts that are very common for other customers like them. For example, we've built a polymers template and that's really speeded up and added a lot of value in the deployment.

In the future, we're going to cloud licensing. I don't mean cloud software right away, I mean cloud licensing. That means taking our license manager which has historically been inside their firewall and taking that to a public cloud. There's a lot of good reason for that and there is very little security risk around the license manager so, that's something they're comfortable doing and there's a lot of value in doing it.

Self-service licensing, customers want to be able to move tokens from server to server or from site to site. We'll give them the ability to understand their entitlement and self-service their utilization of our tokens.

We're investing in container-based deployment. I mentioned this already. So, this gives them the flexibility to adopt the technology when they want to adopt the technology but rapidly lowers the cost of ownership because we can build it in a way that is operating system-agnostic. And we can deploy the technology very rapidly using containers.

And then finally, rapid solution development, we will have one single environment for downloads and for updates in one self-contained and easy-to-use environment. So, that's a little bit about our architecture.

I want to spend much more time on how we're investing in our product features and functions to really support this asset optimization vision. Let's start with smart flowsheets. So, Suresh talked already about some of the challenges that our customers face in evaluating new crudes.

When a new crude becomes available, these customers need to think about the materials and corrosion for example that are being used in their existing infrastructure. They need to think about the equipment in their plants and the configuration of their equipment, is it suitable for the new crudes that are emerging or available at good price points.

They need to identify bottlenecks and improve the overall efficiency of their plants. What if our flowsheets, what if our engineering solutions were smart enough to give the user advice, to be able to ask the questions that a user may not be knowledgeable not to even ask and guide them through some of the insights that a very seasoned engineer might actually understand after years of experience.

So, here we have, this is a HYSYS flowsheet. This is a configuration, an example of a configuration of a section of a plant. And we're introducing a new feedstock. Here, our flowsheet could give the user insight into which process flows might be problematic and which variables in particular.

Here you can see one of the flows is highlighted in red and we see that there's a total asset number that's exceeding the limit. The flowsheets also are telling us that you know what, the distillation column could have a problem given its current configuration. It would likely go into a flooded state.

We could go in and explore further and really understand where are we in terms of our operating envelope and what part of the distillation column is having the problem. It could then actually advise us about how to fix this problem.

In this case, we had a prefractionator to fix the issue. And the model automatically updates and says everything is okay. That kind of workflow is really a form of artificial intelligence. It's actually thinking ahead to the kinds of problems that really historically has only been able to be solved with an expert user.

That's an example. You could imagine how we could take this technology in a variety of different directions. I'm only showing you a glimpse, right? A very simplified example might be your word processor. We take it for granted that it's checking grammar and spelling as you go. It's a very, very simplified example. Our authoring tools for simulation could be doing the same thing.

Let's talk about robust design optimization. So, Suresh talked about how customers want to be able to optimize across many, many different constraints. They want to be able to think about the environmental concerns. They want to be able to think about the profitability. They want to be able to think about the utilization. They want to be able to think about reliability and so on and so on. That's a very complex function that these customers are trying to optimize. It's not just one dimension.

And they're trying to optimize it with many, many, many dimensions of uncertainty, right? So, they don't know what feedstocks are going to be available in the future. And there are seasonal sources of variability. There are operational conditions that these customers will face.

What if we could build out a next generation of software that allowed customers to build assets that are optimized not just for one condition or a couple of known conditions but actually optimize across a broad range of uncertainty and actually having a robust design. That's a very complicated problem.

Here we have examples where our software is already looking at activation so, we can understand the economics and the energy and size our equipment and we're adding in all kinds of new activations around safety and around controllability. We will continue to add more and more.

But what these customers really want to do is take this model and really start to understand the statistics involved in the uncertainty. So, what we can do is we can build out a complex function that includes all the things that a customer would need to think about, all those different dimensions from profitability to environmental security and safety and actually think about the inputs and the odds, the statistics, based on historical data, the actual probability of all those areas of uncertainty.

And we can get a response service. So, we can actually understand not only a local optima but a global optima so that they're building assets that are widely flexible for all the areas of uncertainty that they face. And, of course, that requires complex math and it requires complex high performance computing to be able to run all those scenarios, simplify it and give responses that are understood and actionable.

Let's talk about connecting the lifecycle. So, today, our customers struggle with what they call the FEED. FEED is Front-End Engineering. So, there's a conceptual stage where they're thinking about the basic functions that a plant needs to do and we can model that using HYSYS and Aspen Plus.

But between a conceptual model and a detailed model that has CAD geometries and all the details of what an asset or a plant looks like is Front-End Engineering where all the pieces of equipment and pipes are sized -- sized and specified.

And that process is very painful today. It's a process that requires all kinds of different constituents, estimators, people who are doing detailed engineering, CAD people, project managers, mechanical engineers, civil engineers sometimes chemical engineers, they're often in different companies because engineering and construction forms are involved or consultants.

So, this is a problem that's a very challenging problem because it's globally distributed, multiple enterprises and things are changing all the time. How do you keep track of the actual asset as it evolves from conceptual engineering stage to the FEED stage to detailed design in this multifaceted enterprise with multiple value chain partners?

So, we envision an environment where there's one single source of truth, one single source of truth where all the different constituents can log in and they can see the asset definition through all the different stages of the lifecycle. They can see how the asset is designed at their conceptual stage.

They can see the asset at the FEED stage and it can change and they can get real time alerts as to how it's changed and everybody can sing from the same sheet of music. Further, we think we can do that very early in the process. Typically that FEED process does not begin until the conceptual stage ends.

Our vision is that the FEED process can begin very early on in the conceptual process. We can build out a data sheet actually as we're building out our conceptual model and that data sheet can be kind of a record that keeps all the different partners involved and in tune and we can automate the creation of this data sheet.

We can then also share it out so that there's one single place that all the different partners can log in and we've got a real time dashboard of how the project is trending but most importantly we've got an effective change management process. This is reducing millions of dollars of cost to what has been a very fragmented and information-siloed process. We can also save time because we're starting the process sooner front-loading some of the most difficult challenges that we face.

Let's talk about unified production optimization. Earlier, Suresh alluded to this challenge. Today, in the production optimization space, we've got a variety of different players. We have process engineers. We have traders. We have planners. We have schedulers.

We have APC control engineers and plant managers. And the problem today is that each of these jobs requires slightly different information and slightly different timeframes. Planners are thinking about feedstocks and forecasting what production they need to run, what products are going to be in demand.

Schedulers are thinking more in terms of weeks. And they're thinking about inventory levels and the physical constraints in the -- in the factory. APC control engineers are -- their time is much more immediate.

How do we -- how do we ensure that all of these different functions are sharing information in real-time but also that they're getting the information that they need so that better information and better decisions can be made?

And this is a -- this is really a data model question. So we're investing heavily in data model. What if models were consistent and some cases common for better optimization? So here we have an example.

This is a flow sheet that a planner might use. This is a representation of the plant in the way that a planner might think. A scheduler looks at it not too differently. We could create a similar view but a role-specific view for a scheduler but linked to the same model of the asset.

It's about 80% the same. But by doing so you've reduced any redundancy of information entering, which causes mistakes and errors. And you can make sure that both planners and schedulers and later other functions are all working from a common view of the asset. So it's critical.

So a planner needs to run hundreds sometimes or even thousands of scenarios thinking about crudes, which crudes and production levels, and then later, the scheduler is thinking about inventory levels and production rates.

And the problem that they face is that when the planner is planning his scenario, he doesn't actually know if it's feasible. So he might optimize based on a schedule that isn't going to work. So that happens.

We have planners that generate a plan because it's been months in advance and he didn't have visibility into the schedule and then later it gets to the schedule, they have to redo it and they come up with a sub-optimal plan because it's feasible to the scheduler but it hasn't been optimized.

Our vision is by building out a common data model, you could actually, as a planner, plan an optimal plan but that's also a feasible plan. And as a scheduler, if something changes, you can optimize the plan with the constraints that you have.

So brand new use cases to ensure that we're always optimal as a system and not just from a functional standpoint. But it continues. If we look at a plan versus a schedule and then we compare to the actual, we find that there some differences.

We think we can narrow some of those differences by building out some of this common data -- data model between planners and schedulers but it could be that the asset itself is out of date because the planners didn't get an update from the engineering team that the asset itself has changed.

Some piece of equipment has changed its configuration. So seeing that the plan, the schedule versus the actual is out of sync might be a good hint that the -- that the actual asset has changed and we can tie in directly into a common data model to the engineering domain.

So, now, we've got a common view of the asset from engineering, planning, and scheduling. And it extends all the way into APC. Suresh mentioned that some of our customers are already trying to be thoughtful about linking their schedule right into advance process control.

We think we can make that seamless so we can show that the way an individual asset, an individual unit is being controlled by advance process control is consistent with the schedule which is consistent with the plan and therefore, the overall utility is optimized.

So this is all new. I mean we're the only company that can do this. These are very complex problems. Historically, each of these domains has been completely siloed and companies have workaround to try to bridge some of those gaps.

This is heart of what we mean by optimization and it's at the heart of where we're investing in terms of unified optimization. So now I'm going to talk to you about the maintenance domain, asset maintenance.

And this is really new thinking and it'll be the first time we were or anyone's been exposed to some of this material. Start with maintenance. Historically, the process engineer is involved early on in the conceptual phase of a design.

A maintenance engineer may be involved upfront but more often is tightly linked to operations. The maintenance engineer is really thinking about the maintenance schedules and making sure that the asset is being maintained.

But there's a great opportunity to actually bring these domains together early in the lifecycle and throughout the lifecycle of an asset. So what if we actually understood the historic maintenance challenges and the reliability of our asset when we were designing the asset.

That's what this is about. So specifically when an engineering today uses a process simulation tool like AspenPlus or HYSYS, the engineer is making assumptions about steady state.

They're assuming that any unit is up and they're optimizing their design based upon simplified assumptions about the reliability of all those different pieces of equipment. But we know that plants go down.

We know that units go down. We know that there failures. What if we actually factored in the data about those failure rates and actually use that data in a simulation model along with all the parts of our simulation model to be able to get a complete picture of not only the cost to build an asset, the cost to service an asset, the full lifecycle cost of that asset.

That would allow us to actually not only reduce the cost to the lifecycle but actually ensure that the asset's up at a much higher rate. That's the idea. We're actually now working on factoring in all the historic data into our simulation model so that we have a reliability view, a reliability model as part of our engineering model.

This improves the engineering design. It also improves the maintenance plans. So the maintenance engineers can get involved very early on in the lifecycle and actually improve their maintenance strategy based upon the very same model.

Now, let's talk about prescriptive analytics. We have here several different challenges in the different domains that we sell into. We have process engineers that struggle to get real-time information about how an asset is actually performing in the plant.

And then influence the way is actually being operated. Typically, the engineer doesn't have a lot of levers to pull in terms of the operator decisions. You have an operator that is overloaded with information.

They sit in control rooms. They have all kinds of alarms that are going off, many of which are required from a regulatory standpoint. And it's information overload. They don't really, in many cases, they're unable to react to all the information that they're presented.

And you have a plant manager that's trying to bridge the gap between his process engineering team, which probably has more insight into what's actually happening when problems arise, and the operator who needs to process all this information in real-time and actually make operating decisions.

What if all the data were transformed so that we could make decisions as an operator before any problems arise, leveraging all the intelligence that are actually available to the process engineering in the engineering model?

That's what this is about. Antonio showed this slide earlier. We're building an analytic system that spends descriptive analytics so that is what's happened, why did it happen, diagnostic analytics, predictive analytics, knowing before it actually happens.

And then ultimately, prescriptive analytics. We think something's going to happen and we think this is what you should do about it. We're building up a system for the operator that leverages models from the engineering team and big data analytics looking at the data coming out of the historian to be able to reach insights well before anything happens in the plant.

We think we're the only company that can do this. That can bring the models together with the data to be able to predict problems before they arise in the plant. And we think the only way to solve this problem is to bring models and data.

The challenges here are too complex to be able to just to take a pure data based approach. You can't know just by looking at information that's in a historian what's actually happening in a chemical reaction. It's too complicated.

You need to be able to look at data. You need to be able to interpret the data through a model to be able to reach something that's actionable. Our strategy is to start at the unit. We're starting with columns, distillation columns and to build a complete solution for predictive, prescriptive analytics for columns.

And then we'll move to other types of equipment like heat exchangers and other. Then we'll move to the plant and ultimately to the enterprise. We think the opportunity is staggering. There are a 100,000 columns. So even before we move to other kinds of equipment, there are a 100,000 columns today, distillation columns in the world. And downtime costs about \$10 million per column. And we think the vast majority of that downtime could be prevented with a system like this. So tremendous amount of value that can be deployed here.

How are we going to do it? It starts with data conditioning. So we're lucky we have a historian that's part of our portfolio, IP21. So we've got a upgrade install base but half of the plants in chemicals are using our historian. But we've designed it to sit on top of anybody's historian including Pi. So our strategy is to broadly deploy our analytic solution anywhere there are distillation columns.

We then build out a first principal model that is an engineering model that is tuned to the actual configuration in the plant. We build out an empirical model also that is if you don't have a robust model based on first principles, we can build the model based on the data that's available.

We use that model to build a root cause model. That means that we understand all the data that's being collected about that asset and how it relates to other pieces of information. So if something goes wrong, we know what the root cause of that problem likely is. We use these underlying pieces of technology to build kind of an operating model. In this case, you see an operating model for column hydraulics, that's an operating envelope that is built on all the models that I described earlier.

And we've built out pattern match capability so that when a problem arises, we can find out when it arose previously and ultimately put predictive alerts based not only on the model prediction but on looking for these kinds of patterns as they emerge together.

We take all this technology and we present it in a very simple dashboard to the user who is an operator. What makes this technology special is it's designed to have very minimal services.

We think we can leverage a lot of the technology we've built out in APC around cells maintained and adaptive technology. The underpinnings here are exactly the same. So we could rapidly deploy these first principle models, these empirical models, these root cause models, build out an operating model.

Build out pattern capabilities and ultimately build the dashboard. As Antonio said, slap on very little services and get customers up and running fast. And actually have it be self-maintained. So once this dashboard is up, it heals itself. If something funny is going on in the data it understands and it heals, so it's self-contained. We think that this is hot

stuff. We think that this is going to be incredibly valuable to customers, it's going to be easy to sell, it's going to be easy to deploy, and it's a major part of our strategy.

This is an example of what that dashboard might look like. So here we have six specific alerts. Some of these alerts might be based on a model, some of these alerts might be based on a pattern match, and we can drill down as an operator to really understand.

So in this case we drill in and we see in this case one of those alerts was around a C2 splitter and it says it's going in to a flood state, here's the probability it's going to go into a flood state, and here's some prescriptive advice about what to do about it before it happens.

We can then as an operator very quickly say, "When did this happen in the past, so that I can really understand is this something that's been recurring and maybe actually in addition use this pattern to look forward if it ever happens again, so I can build another alert because we've learned something."

Ultimately, all of this becomes very interesting when you combine it together. So the asset analytics is looking at models and patterns to find problems before they arise. As we learn about problems and fix them, we can use our engineering model to actually figure out how much of a challenge is it to fix this problem and given the production schedules, when would be the right time to actually fix it.

Ultimately, all of that gives rise to a better maintenance strategy. So we've learned and as we learn we're improving our maintenance strategy so that these problems are prevented and we don't even have to face alerts the next time around so this is a closed loop system.

This is a pretty exciting strategy and it's kind of a down payment on our overall asset optimization vision. This technology will become available this year. So this is not something that I'm talking about as very far out on the roadmap. This is a third product family that will become available with a new token pool, all new growth opportunities for the company will be launched later this year.

Okay. So I'm going to end with a little video that we'll be using with our customers to kind of whet their appetite about this new product family.

[Video]

UNIDENTIFIED AUDIENCE MEMBER: Manufacturers around the globe are losing billions of dollars a year due to unplanned downtime and off spec production. We've all heard about how big data and the internet of things is influencing general business practices, but in this industry the stakes are higher. Millions of dollars are lost in downtime and a mistake can have disastrous environmental or safety consequences.

And the problem is more complex when you consider the massive amounts of real time data, the complex chemical interactions and the most sophisticated and expensive equipment. Generic big data firms just don't get it for this industry, but there is another way.

Aspen Tech is breaking new ground by combining cutting edge data science with the most sophisticated process modeling technology. With 35 years of trusted experience, Aspen Tech introduces Aspen Asset Analytics, the first and only solution for the process industry that leverages models they already have, can be rapidly deployed, is self calibrating, and self maintaining.

Our analytics combines models, historical data, and data analytics to predict unplanned events before they happen and prescribe corrective action. Pattern discovery takes large datasets and identify similar events in a timeline. Root cause analysis uses these similar events to predict future events so operators can make better decisions.

Aspen Asset Analytics is a major step in moving beyond process optimization towards asset optimization. Companies in the process industry can save billions of dollars every year and that's just the beginning. Aspen Asset Analytics.

[Video Ends]

JOSH FREDBERG: So with that I'm going to conclude. Thank you for your time and I'm going to pass the baton to Karl.

KARL JOHNSON, SVP OF FINANCE, CFO, ASPEN TECHNOLOGY: All right. Thank you Josh. I forgot my glasses. Okay. All right. Thank you. Good afternoon everyone. So today I'm going to be walking us through the financial model for Aspen Tech, go over some of the Q3 year-to-date results and then we'll wrap it off with going over our preliminary view of fiscal year '17 guidance.

So as Antonio mentioned earlier, Aspen Tech has a multibillion dollar market opportunity. We have a proven track record of being able to grow into that market while maintaining our profitability and cash flow metrics which are best in class in the industry, which result in our strong balance sheet and income statement and cash flows which ultimately fund our capital allocation strategy.

Our focus is to drive shareholder value through growing organically and inorganically and when applicable and when accretive, returning capital back to our shareholders. Excuse me.

So when we start to look at the financial model for Aspen Tech, we start with the annual spend. So annual spend is a metric that we have that gives insight into our customers' base growth and into the churn of the health of that base and also as a leading indicator of our revenue.

For those that are new to the story for Aspen Tech, annual spend is simply the aggregation of all our current invoices for our subscription term maintenance and license agreement. Ultimately, it's a proxy for our annualized subscription revenue at any point in time.

The real strength of our annual spend comes from the underlying customer contracts. Our contracts have a five to six year term, have 2% to 3% price escalation on an annual basis and are non-cancellable.

Customers can add additional entitlement during the period or if they were to add additional entitlement, they're unable to cancel that before the end of the term. As you can see, historically our growth rate in the annual spend has been in the low double digits. In fiscal year '16, the oil prices had an adverse impact on a couple of our market, specifically the E&C and the upstream but we still expect to have 3% to 6% growth in annual spend that's really related to the strength of our downstream and our chemical verticals.

And before we leave this slide, I just want to remind everybody, I get questioned a lot of how does annual spend turn into revenue? And we recognize revenue on subscription basis so what really means is if you grow annual spend in one period, it really isn't reflected until the subsequent quarter into revenue or on the balance sheet. So really starts when we invoice the customer.

So to really understand annual spend, you have to understand how it grows and to understand how it grows we break it into its components. So annual spend starts with the beginning annual spend which is really the contractual base that you have exiting the prior period. And as I mentioned, we have 2% to 3% escalation every year.

So that annual spend will grow 2% to 3% right through the year, doesn't come in at the beginning but will grow over the year just through that price escalation. The largest contributor that we have to our growth is new entitlement or new spend. Now our customers really do this in two different ways, the first on renewals, customers will reevaluate their need, they'll look at volume discounts, and they usually will then adjust their spend.

Also and just equally important is the customers will during the contract term add additional entitlement, and we've traditionally seen this being, well, a lot of growth in both of these and we continue to see that even in this market.

The third contributor to growth and it's a much smaller contributor is new logos. Typically this comes from our S&B group which is the equivalent of our inside sales. So think of small, medium businesses, these are smaller engineering companies that we sell into. But again, it's a much smaller piece of it.

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And when we look at these three pieces together, this is what we refer to as gross growth. So a bit of a mouthful sometimes when we say it, but we're looking at this is where the growth comes from in annual spend.

Now going against that is a new term we're using which is attrition. So again, I'll dive into this in a moment, we've typically talked about nonrenewal rates. When you think of this, think of it as the percentage of annual spend that was up for renewal in a period that didn't renew. And again, it may not renew meaning customer renewed with lower entitlement or they didn't renew at all.

Take that as a percentage of your beginning annual spend. And as we look at these four components, this is the net growth that we report. So when we report annual spend growth, these are the different components. And you just take it across to get to your annual spend.

So as I mentioned earlier, we're starting to look at the renewal rates differently. And again, it will approximate each other. Historically, we've given renewal rates based on our TLCV metric which we used during the conversion from our old commercial model to a new subscription model and it's been based on that.

Because we look at annual spend for growth, we're going to start providing information on renewals based on annual spend. And again, you can see they approximate each other, they're not that different but again, just to have a consistent base of information that we're working off of, we're going to work off of annual spend.

So again, you go through how do we define it, attrition? A customer comes up for renewal, they renew a portion of their previous entitlement or they don't renew, that aggregate amount will go against our beginning annual spend.

An important note for this is also, if a customer were not to renew in a quarter, say renewed late but then they renewed in a subsequent quarter, they would still be in the attrition rate, we would not retroactively adjust the attrition rates. So we get attrition rates at a point in time that are cumulative and that customer would still be in there for the full year's attrition rate.

Currently right now we're running about 5% and that's year-to-date Q3, so we still have another quarter of activity that could influence that up a little bit, and you can see that compares to our year-to-date TLCV of about 4% to 5%.

So again, the takeaways from here, it's not that much of a different metric from what we've provided before, it's based on the same metrics that we're giving to you for growth so now it can be comparable. And lastly, we'll be providing this on an annual basis.

So the other area I get a good number of questions is deferred revenue, and how does it grow and why is it a little bit of inconsistency between quarters. So when you think of annual spend, it will grow in accordance with - I mean when you think of deferred revenue, it grows in accordance to the annual spend but it trails it.

So annual spend will come in one quarter, the reflection of that predominantly will be on the balance sheet the subsequent quarter. So they'll trail it a little bit and then you'll get a lot of volatility between quarters and that's really related to our nonlinear invoicing.

So as you can see, Q1 and Q2 are our lowest invoicing periods and these are our fiscal quarters and then Q3 is the highest and then Q4 is a little bit down in the middle. And what's interesting to note is that in Q1 and Q2 your invoicing is below your revenue. So you're going to see a decrease in deferred revenue.

And the reason a lot of these questions come up is until this year, until fiscal year '16 we were in the middle of a transition so it wasn't a meaningful metric. So we couldn't compare between years and now you can.

And just one last point on the deferred revenue, when you go comparing fiscal year '16 to fiscal year '15, one of the points you have to remember is that in '15 we had about \$10 million of deferred revenue that wasn't recognized on subscription basis in '16. So in '16, we have about \$10 million of revenue that we've talked about in our earnings calls that was in deferred revenue in '15 that came in as sort of a lump sum, it didn't come ratably and additionally was not replaced. So we don't have that anymore. So when you adjust '15 for that anomaly, you'll see that '15 and '16 the growth rates really start making sense when you compare them to annual spend.

So I shift into our profitability and our expense metrics. This is our current view of our target operating model and this is where we see the optimum level between investment and profitability.

And when you think of those investments, that's the fund the items that Josh talked about, funding our infrastructure, corporate infrastructure and this is consistent with last year and an R&D about 14% to 15%.

If we were to grow a little bit more rapidly, so if you were to see an uptick in the revenue, there is additional leverage in this model, it isn't linear, you wouldn't see that move directly with revenue so you would expect to see a little bit more leverage coming out of that model.

So comparing our Q3 results to our target values, you can see that for GAAP and non-GAAP operating margins, we well exceeded both of those. But you really need to look at fiscal year '16 and adjust it a little bit for a couple of items. So we had that \$10 million of revenue that I talked about earlier, so that artificially brought up '16.

In addition, we're running behind where we forecasted annual spend so your commission rates are running a little bit behind where they normally would be. So when you adjust for both of those, you start coming back into what our target values would be. So '16 a little bit inflated and lastly you also have to adjust a little bit of '16 which is hard to get the numbers for you but KVC, when we started bidding on KVC, we slowed down our internal investments and spend and hiring in anticipation of that acquisition.

Once we decided not to continue the bid for KVC in Q3 and Q4, we then continued that investment and started ramping it up which you could see was in our Q3 actuals and our Q4 guidance.

So this is a good slide to show where the leverage and our models come. So for the past five years we've been able to grow revenue steadily on consistent expenses. As you can see in '16's guidance, it's a little bit of a tick up over '15. And if you were able to break and take a look at just what we were saying for Q3 and then our guidance for Q4, you'd see that a lot of that is a little bit lopsided toward there. So your exit rate is a little bit higher.

So as you enter '17, you get a slightly higher expense rate and that really reflect some of those investments that we've been talking about both in R&D, marketing, and then also the corporate infrastructure.

And both of those lead to our cash flow. So our cash flow is truly one of the most predictable, strong metrics that we have. As you can see in '16, we became a cash tax payer and that we're anticipating about \$65 million to \$70 million of taxes being paid in cash in '16.

If you were to adjust our '16 guidance and then look at '15 to take it down for the nonrecurring receipts we talked about in Q4 of '15, you'd see that that growth rate would be approximate that 3% to 4% that you would have expected.

So that leads us to our capital allocation. So we talk a lot about our capital allocation. We have a very disciplined, methodical approach to our capital allocation. We typically look first to M&A and that's really because we see M&A being accretive on the long-term for our shareholders over other options.

But again, still as Antonio alluded to earlier, any M&A opportunity is evaluated both on financial and strategic basis. So we have certain targets that meet the financial but they may not meet strategic and vice versa. KVC was one of the first ones that met both until the point that hit an inflection point when Yokagama came in and upped the bid, it crossed a threshold where it was no longer from a financial point of view accretive to the business.

When that happened, it's a great example of the discipline that we apply to our capital allocation is we reevaluated the opportunity, looked to returning worth to shareholders and it was more accretive to return that capital to shareholders than it would have been to keep pursuing KVC.

Looking at our target capital structure, we see having approximately \$100 million of cash on hand combined with a half turn or two turns of leverage being the optimal for us. That \$100 million of cash, it's not a defensive position but it's more to allow us to be very nimble and aggressive as we see opportunities, strategic opportunities arise.

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We also have leverage - we have capacity under our line of credit for about \$110 million that will allow us to combine to that quickly on any M&A opportunities. We've recently put on the leverage for first time in a little while in this company's history so we have about \$150 million are just under half a turn of leverage and we have about \$250 million of total capacity of the line.

We would see going up to three to four turns of EBITDA for a strategic opportunity but then coming back down afterwards as we integrate whatever the opportunity might be.

So historically you can see how we've been allocating our capital and you could see it's very heavily weighted toward returning capital to shareholders, and we do that when we see that disconnect between the intrinsic value of the company and what the market is valuing us.

When we see a disconnect and we see an opportunity, we deploy capital to take advantage of that opportunity. In general, this is a reflection of that opportunity being there, deploying capital against it, but even more so the opportunities that we have in M&A, we do review them but again we haven't had any larger ones that meet the criteria that we've been looking for.

And the amounts you do see for acquisitions are really related to some small tuck-in acquisitions. So the impact that this has had over time on our shares is we bought back at the end of Q3 roughly what, \$616 million worth of shares and that's reduced our outstanding shares by about 12%.

And that 12% is roughly about - it's 12% but it includes, it's a net number so it includes the impact of the additional shares that we've been issuing under equity plans, so the 12% is a net number. You can see it's had a significant impact on our outstanding shares.

So turning to guidance, so a couple points before we dive into guidance. For fiscal year '16, we're not changing our view so we're going to maintain the view that we shared during Q3. And again, this is our preliminary guidance based on where we are today. So we're a little bit out from the start of '17, this is where stand today.

So I'll start with annual spend. So we're guiding today for about 3% to 6% of annual spend growth next year and really the assumptions that are related to this are that we're assuming the current market conditions that we're experiencing today will carry forward to next year.

We're seeing that the increase in oil prices that we've just seen since February really aren't going to have material impact on the buying behaviors of our customers as they're going to start their budgeting process come the September-October timeframe and that will take some time to work its way down to us.

And lastly, we're assuming that we'll have either flat or slightly down attrition rates. So we're going to assume that we're going to have roughly the same to slightly down attrition next year.

UNIDENTIFIED AUDIENCE MEMBER: And when you say down, in other words five or worse? Five or worse versus two to three attrition?

KARL JOHNSON: So five or better. So going to how that translates into revenue for next year, so we'll be seeing 470 to 477 of total revenue.

And when you look at this, it's important to look at fiscal year '16, you need to pull out the \$10 million of nonrecurring revenue that was in there because again, that wasn't part of our subscription base, it was a revenue that got hung up and was delivered in prior periods but due to accounting rules we had to hold on to it.

So when you look at that and you adjust '17, you'll see that you'll have about a 4% growth in your subscription base and about 10% reduction of professional services. And what that's reflecting, the down in professional services is really reflecting the discretionary spend that's being cut at our end customers, training, discretionary professional service projects.

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And again, some other important points to remember is in '17 we don't have any more one time revenues hung up on the balance sheet so we won't expect to have any more onetime items coming in. And lastly, the revenue will fluctuate depending on how annual spend comes in. So we have a view on how it's going to come in but if it were to change that could impact us.

When we look at fiscal year '17 expense guidance, again you have to look at the '16 and right size it for a couple of those items that I talked about earlier. But in general, this is reflecting our investment in R&D and in the corporate IT infrastructure, and to a lesser extent some of our digital marketing.

And we're making these investment now because unlike a lot of our competitors in other companies, the strength of our financial model, the strength of our customer contracts, the cash flow, they allow us to make these investments now so that when this market turns around and we start seeing higher oil price, and so the spend starts coming back we'll be well positioned to take advantage of it.

So this leaves us to free cash flow. So again, we're expecting \$65 million to \$70 million of free cash flow of cash taxes next year and about \$160 million to \$165 million of free cash flow.

And again, in that number, it equates roughly about 2% to 3% growth year-over-year and in that number includes about \$3 million to \$4 million of interest expense that we're leaving in and we're not pro-forma-ing out the expense.

UNIDENTIFIED AUDIENCE MEMBER: That's flat share year-over-year?

KARL JOHNSEN: Yes.

UNIDENTIFIED AUDIENCE MEMBER: Per share basis?

KARL JOHNSEN: So we're keeping that. We have not taken out the impact of the \$400 million.

So in summary, we're looking at about a 46% to 40% Non-GAAP operating margin which again slightly down from last year but again, we're taking advantage of the opportunity to invest in R&D and our corporate infrastructure.

It doesn't include onetime revenue items, it doesn't reflect any potential acquisitions that we may close in the year, and lastly the \$400 million of share repurchases are not reflected in the guidance for shares.

I'll give everybody a moment to write down. Correct. Okay. So everybody, I'm going to move on to the closing. So in summary, due to the strength of our financial model, the customer contracts, we're making investment today that in a lot of ways represented by what Josh explained to us earlier, in the products, in the development such that we can take advantage of that multibillion dollar market opportunity in the future.

This is all done with again a strong shareholder value increase focus for us and again we're relying on that financial model that's been built up over the last five to six years.

So with that, I'll invite Antonio and Josh back up to do Q&A.

+++ Q&A

ANTONIO PIETRI: All right. Thank you Karla and thank you to the Aspen Tech team for the last four hours.

Hopefully you've got a better idea about the company, our strategy, our product direction, how we think about our products and how we think about running the company from a financial standpoint in '17.

So now it's time for questions. [Monica].

UNIDENTIFIED PARTICIPANT: (inaudible microphone inaccessible)

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ANTONIO PIETRI: Yes. [Monica], from our standpoint - so [Monica] is asking just so that the audience on the webcast understands the question. [Monica] is asking whether - what are the assumptions we have put in to our guidance, annual spend guidance?

Well basically we feel that we're in the middle of the adjustment that's going on in the industry. Yes, oil prices have moved up to \$45-\$50 a barrel, but that's only in the last month.

Time will tell whether they're going to stay up there and time will tell what customers would budget for '17 so we felt that the conservative assumption and the right assumption was to assume that things will remain the same and we'll see how the fiscal year develops as we get into it.

UNIDENTIFIED PARTICIPANT: In the annual update of the last earnings call, you talked about (inaudible microphone inaccessible)

ANTONIO PIETRI: Uh-hmm. Yes. We said in our earnings call for Q3 that we are working on these three NOC contracts and we had some sizeable transactions in the pipeline for Q4.

We're a month from the end of the quarter, we continue to work all those deals and during the earnings call for Q4 we'll tell you what happened. We'll tell you what happen in our earnings call for Q4.

UNIDENTIFIED PARTICIPANT: So when you look at the fiscal '17 guidance, since you give us kind of the heads up about the NOCs for this year, what should we expect in terms of what that rule pipeline looks like next year so we can apply the - you know, the attrition rate, the 5% of that (inaudible microphone inaccessible)

ANTONIO PIETRI: Well certainly these three contracts that did not renew contributed materially to the attrition rate in '16.

I also said in our Q1 earnings call in October that we had a unique situation this year, we had an accumulation concentration of these NOCs renewals this year. That does not exist to the extent that it did in '16.

So we are assuming though that we'll have outside of those type of renewals we'll have a similar attrition rate just because we haven't seen a change in the condition and that's the assumption that we have in our guidance.

UNIDENTIFIED PARTICIPANT: Could you frame the opportunity for the new (inaudible microphone inaccessible) you talked about maintenance optimization and analytics, you know, if you have a customer spending \$100 of annual spend with you.

And they take on both of their products kind of as you would hope, where does that \$100 go to? Does it go to the \$120, does it go to \$130? Just help us frame how material they are in terms of moving the needle.

ANTONIO PIETRI: Well look, as you should have mentioned, just on this initial release for analytics and the focus on columns, by the way the 100,000 columns is on the chemicals market alone, it doesn't include refining.

We haven't priced analytics offering yet but you can consider that it's material to our existing TAM, okay? And the other thing is that we also believe that these are separate budgets from where customers fund our technology today. [Stanley]?

UNIDENTIFIED PARTICIPANT: So if you look at the - earlier in the presentation you looked at the massive amount of savings or activity that you give your customers. Obviously right now is probably a hard time to think about pricing but it would seem like there's such a massive disconnect between the value that we're giving them and what you're charging.

You know, is there an opportunity to revisit that, to think about gain share type of pricing and other things moving forward?

ANTONIO PIETRI: Well look, I think the introduction of asset maintenance and the aspenOne maintenance and analytics suite is an opportunity to price the new solution at fresh price points and token values for the new solution.

Even though it's going to leverage existing products, the products that are required to run those solutions will go into that suite as well and will allow us to sort of start afresh with a new suite and a new space.

And you're right, when you look at the value that we generate is sometimes a 100 to 1, can we get more for what we deliver? We always try but, you know, there are constraints that we push against.

UNIDENTIFIED PARTICIPANT: We'll be flipping around the other way, we look at the, you know, the weight space as you outlined in the (inaudible microphone inaccessible) for the last couple of years and think about or talk about how you drive the penetration.

It seems like the way that you're driving penetration like be shifting again to more of a top - you know, get higher in the organization and try to get more of a mandate across the business. You know, how should we think about how long maybe it takes to get some of that traction so maybe we can see more penetration of that?

ANTONIO PIETRI: You heard when we announced the KVC acquisition that one of the rationales for it was that C-level mindshare that KVC had.

With Bill Griffin coming into the company, we've put a greater emphasis on engaging at a higher level with our customers. Bill is leading that initiative and eventually we believe it will start paying off for us.

How long it will take? We'll see but we're confident on that. The one thing about Aspen Tech that I'll mention, you know, Aspen Tech of course in the context of the Oracles and maybe even the Salesforces of the world, the Microsoft is a small company but the fact is that we have tremendous access to C-level executives as well and it is not a hard work to get in there and talk to them about broader deployments of our software. So we're confident that we can get that traction. Go ahead, yes.

UNIDENTIFIED PARTICIPANT: Yes. On the maintenance said that you mentioned is very fragmented space, there's (inaudible microphone inaccessible) are these companies you could potentially rollup or are they part of a larger organization?

And also in terms of how you plan as part of the maintenance department, is it primarily green space or more displace some of these practices (inaudible microphone inaccessible)

ANTONIO PIETRI: Well look, it is a fragmented space. There's multiple player, some small and some, token small and perhaps you could qualify one of them as medium size.

I just like to remind people when Aspen Tech consolidated this advance automation space and operations, it took eight years to acquire 23 companies. This isn't going to happen overnight, this will take probably multiple years to consolidate the space if that's what you want to call it.

But we do think it's going to require multiple acquisitions and organic development in our part as well as leveraging what we have on the design and operation space. [Monica]?

UNIDENTIFIED PARTICIPANT: Just as a follow-up with that, also with the predictive (inaudible microphone inaccessible)

JOSH FREDBERG: Yes. We're running a lighthouse program now. So what that means is the software commercially meets our requirement, it's quality but we picked a dozen or so leading accounts.

Every one that we approached wanted to work with us and we were oversubscribed. And so they're actually putting this technology into production and we're trying to collect the data and the results so that when we launch the product, not only can we talk about the technology but we can actually talk about the value that's delivered.

UNIDENTIFIED PARTICIPANT: Then you've talked about (inaudible microphone inaccessible)

ANTONIO PIETRI: Soon. Yes.

UNIDENTIFIED PARTICIPANT: Just on that, I think you had a slide that said if you adopted analytics with these tokens, is that...

JOSH FREDBERG: That's a visualization layer on top of NBS. That's not the same thing as the maintenance and analytics product suite. So we're going to probably have to rename that so that there's no confusion.

UNIDENTIFIED PARTICIPANT: Is there any I guess risk that you layer on a third party (inaudible microphone inaccessible) to achieve some or all of what you're going to be developing? Versus what you're developing or is it impossible to do that?

JOSH FREDBERG: I wouldn't say. I mean, [Monica] you also asked about is this new, is it competitive?

We haven't found anybody that's actually focused on a process industry using models and data science to predict outcomes. There are firms that are trying to use data to reach conclusions but we haven't found anybody that's doing that successfully in these kinds of problems. So it's all new and it isn't something that a generic BI tool is going to be able to do. It's much more than that. The math involved is very sophisticated and it's our crown jewels of the company.

ANTONIO PIETRI: Yes?

UNIDENTIFIED PARTICIPANT: A couple of (inaudible microphone inaccessible) in R&D resource that are going to be necessary to support this rollout, you know, are you going to need (inaudible microphone inaccessible) that is already doing it?

ANTONIO PIETRI: Well I'll answer the second part of the question first. You know, we've been working on this for 18 months solid with a sizeable team.

So that expense is baked into R&D expense. Will it go up in the future? Perhaps but I don't think it's going to require tens of millions of dollars of additional investment. Look, it's the same customers. It's the same customers, it's perhaps in some cases a different department, the maintenance department in those refineries as opposed to the process engineering department or the control department and I believe that our sales account teams will be able to manage those accounts with the same headcount.

Will require some additional headcount from a technical sale support? Perhaps. You know, as we grow the opportunity, I can see as a staff as we see the opportunity grow.

UNIDENTIFIED PARTICIPANT: This year and next year when you talk about (inaudible microphone inaccessible) of this year. Does that mean that it's not this year they're going to be (inaudible microphone inaccessible)

ANTONIO PIETRI: Yes. Well look, we'll see what happens with the NOCs and where they will be whether they'll be in this year, next year. We'd assume some things about next fiscal year, again, the attrition rate, what we're seeing in the business. The NOCs whether they are full renewals or partial renewals of what expired, time will tell as well. Yes [Stanley].

UNIDENTIFIED PARTICIPANT: When you guys showed the attrition rate, are you measuring that by customer attrition or token attrition?

KARL JOHNSEN: It's by dollar attrition. So we'll tell you again. So it's the dollar amount of the annual spend that's up for renewal and then whatever doesn't renew, that's the amount that we'll aggregate.

UNIDENTIFIED PARTICIPANT: That way you'll capture the - because I can't imagine a customer goes away.

KARL JOHNSEN: Yes, they go - they trick down the - yes. So they'll be comparable to annual spend because annual spend is based on dollars, the attrition will be based on dollars.

ANTONIO PIETRI: Yes. I think Karl and the team did a very good job coming up with a metric on attrition that is tied to annual spend which is a metric that were given you guys.

Yes, go ahead.

UNIDENTIFIED PARTICIPANT: What was that historical attrition rate on annual spend? Can you give a historical year-to-date on TLCV and it would be the year-to-date attrition, the annual spend historical.

KARL JOHNSEN: Yes. So it's a new metric for us. So we did go back and look at it, it's in that 3% to 4% range. So again, it seems to be tracking just to the mechanics of the math of annual spend versus TLCV about half a point to a full point above.

ANTONIO PIETRI: Yes.

UNIDENTIFIED PARTICIPANT: Two questions, one just in terms of activity, how are you thinking about it now with the trends, what does look like? And then two is more on the (inaudible)

ANTONIO PIETRI: Let me answer the first question. Look, of course in this environment the sales productivity, I used to think that - well and I believe we had done an excellent job driving the sale productivity per sales account person significantly up.

Of course in this environment that's come down through the floor. We need to get back and then as the business grows rebuild the sales productivity and that's part of what we're focusing on. I do think there's been an opportunity over the last six months to look at especially the SMB organization because that's an organization that grew very rapidly as a business crew over the last three years but it's also an organization that got hit first nine months ago.

So we've looked at that and as part of the job that Bill is doing on making sure that we had the right investments in the right regions and groups to drive growth in the future.

KARL JOHNSEN: So on the new revenue standard, on 606 we're still evaluating what the impact will be on us. We'll start developing a view on that as we - in the next couple of months to quarters and we'll probably in '17 start giving some initial thoughts on where I think it's going to be.

And it really just started finalizing it so there's a couple of open pieces now that's really settled down and starting to get agreement on the last open items, we'll start a process of analyzing the impact. But for us we'll adopt it for fiscal year '19 so we'll be adopting it 7/ 1/2018.

ANTONIO PIETRI: Yes.

UNIDENTIFIED PARTICIPANT: The 2% annual escalator that's contractual, so you have visibility into that (inaudible) for large customers, how much visibility do you have that special services being done is the right number?

ANTONIO PIETRI: Well I mean look, we do a forecasting exercise at the beginning of every calendar of January, February timeframe and we look at really two and a half years ahead but this time we really put the emphasis a year and a half ahead.

We'll deliver certain performance in fiscal year '16 for professional services while we're projecting for professional services in '17, bakes in underperformance and bookings in that area and therefore the revenue has slowed down.

UNIDENTIFIED PARTICIPANT: To execute the \$400 million buyback, was that due from cash on balance sheet plus (inaudible microphone inaccessible) or do you take on additional debt?

KARL JOHNSEN: So that's going to be the cash on hand plus what we generate in fiscal year '17.

ANTONIO PIETRI: Yes?

UNIDENTIFIED PARTICIPANT: Did you guys track promoter scores internally?

ANTONIO PIETRI: Yes, no. Look, I think part of our engagement with customers is focused on making sure that we're better attuned to our relationships with our customers both on the product innovation side where customers felt we were a little distant from them over the last few years.

That's one of the big changes that Josh has driven in the last 18 months, it just get a lot closer to our customers on product innovation and we're seeing the feedback and increased enthusiasm from customers in that area.

On our sales relationships and customer support relationships, we are working also on improving those relationships from beyond what they are today and there's always room to improve our net promoters scores and that's something that we're always working on.

It's an area that I'm emphasizing to the organization just because I believe that the better your customer relationships the better it is easier to do business and the more appreciative they are of what you do so. Yes.

UNIDENTIFIED PARTICIPANT: In terms of the competition that you're ability to sort (inaudible microphone inaccessible) at all or I guess know the way (inaudible microphone inaccessible)

ANTONIO PIETRI: Well I mean look, in extreme environments you see sometimes irrational behavior and I think we've seen that from some customers and also from competitors.

I think time will tell what the outcome of these downturn and competitors. We've heard through the market that one of our competitors closed part of their operations in the region and moved them to another region, but I do think that there's no doubt that through the work we're doing in our products and the increased focus that we're driving with our customers we're going to extend that lead on them. But we're in the middle of the maelstrom at the moment. Yes.

UNIDENTIFIED PARTICIPANT: On the balance sheet, what is the (inaudible microphone inaccessible)

KARL JOHNSEN: Well right now we're in a revolver just because we're anticipating do we want to kind of like bring it up or bring it back down to it fits our needs now. If we thought we're going to have permanent debt on there then, yes, we would take a different view into different instruments. Is that your question is do we have more long-term debt?

UNIDENTIFIED PARTICIPANT: Yes. But (inaudible microphone inaccessible) balance sheet?

KARL JOHNSEN: Yes. We have to bring it on for a reason though and that's one of the things because as you saw, there's not a large M&A opportunity out there. If there was, that would be the mechanism to start bringing it up.

At least in fiscal '17, maybe beyond that that position could change. But right now we're planning on buying back about \$400 million in '17. So leveraging up to buy back, you know, additional amounts probably isn't the right answer. If the right acquisition came around, we need to lever up, we may use the revolver to execute it and then shift it over to a more long-term.

UNIDENTIFIED AUDIENCE MEMBER: Can you provide some more specifics on the investments of China? Are you opening up any facilities?

ANTONIO PIETRI: Well I mean I won't give you specifics on headcount but what I'll tell you though 10 years ago the private chemical industry in China was about 10% of the total chemical industry.

Today it's 53% of the total chemical industry and the chemical industry in China is multiple times of what it was 10 years ago. We believe there's a significant opportunity in China for us to move more aggressively into the chemical's market and that's really a sales headcount investment and probably customer support at some point.

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We have already made in FY16 an investment in that regard, you know, that growth lags investment but as we see the growth we'll continue to invest in China. I actually think that is a significant under-tapped opportunity for us, China.

UNIDENTIFIED PARTICIPANT: It's more of a (inaudible microphone inaccessible)

ANTONIO PIETRI: Yes. I think methodical. I mean we want to make sure that we've made an investment already, we want to see that return and then continue to invest after that.

But I - we've been in China since 1983, we've been very focused on a segment of that market. We've been - we've done very well there. Some of our largest customers are in China as a matter of fact but there's still a significant opportunity there for us. So, yes.

UNIDENTIFIED PARTICIPANT: Just specifically in the product level. So the MSC suite, is that (inaudible microphone inaccessible) experience? And then comparing the two products, the retention rates...

ANTONIO PIETRI: Yes. That's right. Yes to everything there. Yes.

UNIDENTIFIED PARTICIPANT: I'll just ask on the balance sheet (inaudible microphone inaccessible) is really higher than that. But why wait for a transaction or something?

ANTONIO PIETRI: But I mean I think it's more a philosophical sort of point of view from our standpoint. You know, we saw an opportunity to announce that \$400 million share buyback for next year considering that we had taken on already a certain amount of debt as part of the KVC acquisition.

Taking on debt for the sake of debt is not something that we've considered in the past unless we saw a significant dislocation between our share price and what we thought they were valued. So it's not something that we'd consider. Just we've had a lot of offers from different sources to really lever up the balance sheet and it's just not something that we consider.

UNIDENTIFIED PARTICIPANT: Folks want to lend you money?

ANTONIO PIETRI: There's people willing to lend money out there. Yes.

UNIDENTIFIED AUDIENCE MEMBER: Just play devil's advocate, you started last year with an annual customer spend growth rate that kind of came down through the year.

I mean given the preliminary guidance that's kind of in line with what you're experiencing currently, why didn't you take, you know, the opportunity to just take it down a step and, you know, kind of kitchen sink in so people feel like, you know, what, yes, feels like the worst is behind us and this is the number that you can come back and, you know, people raise on the annual customer spend. What is it about the pipeline or something else that using the confidence that this is the number to work off of?

ANTONIO PIETRI: Well I mean look, like I said human psychology, it's interesting and I'm not going to do a course on human psychology here but at this time last year we were in line for a double digit growth year and all the projections show that.

We've done our sales projections for the next year and a half, two years and human psychology would detect that, you know, you tend to be much more conservative in that case because of the environment that you're in. We looked at the pipeline, we scrubbed it, upside down and sideways and we concluded that three to six is the range that we can deliver for in '17. Yes.

UNIDENTIFIED PARTICIPANT: Can I just ask you a question? So you talked a little bit about making (inaudible microphone inaccessible) services proactive, problems being detected. You also addressed the prospect of perhaps providing invites to your customer.

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If you weighed the consequences of providing advice that's based on a model turn out to be inaccurate, how does that play to your thought process of looking forward in (inaudible microphone inaccessible)?

JOSH FREDBERG: You want to take this or should I?

ANTONIO PIETRI: Well you can give a try and then I'll follow.

JOSH FREDBERG: Customers are using models today to answer questions. They're using them in engineering; they're using engineering models in operations.

It's no different really than using our technology the way they view start technology in the past. The liability for a software company to provide an answer and what's done with that answer, I don't believe the liability is with us.

But we do try to provide confidence, confidence intervals so that we know - you know, when you saw the actual screen that said there's something going to happen and then had probabilities involved, so try to provide that kind of confidence interval so that as much information can we provide and what actions are taken and whether there'd be an action and then the company would be liable, I don't think that's within our contracts, I don't think that's a liability for us.

UNIDENTIFIED PARTICIPANT: But that's really the fundamental question is between your contract that whatever suggestion your software comes up with about running the operation or parts need to be replaced.

JOSH FREDBERG: Yes. Ultimately the decisions that are made, the responsibility of the company, so whether they're using our software to design a plant, whether using our software to make an operating decision, it's the same. Ultimately the operator has the role to make the right decision.

ANTONIO PIETRI: I think Josh has put on - at the end of the day those recommendations, those prescriptive actions are in the context of either an engineer or an operator looking at them and judging them in the context of their experience operating that asset. And having been an applications engineer, implementing advance control, what you see is operators and engineers testing out whatever recommendations come out of software to make sure that they're valid and building the confidence that eventually leads to more regular use of software.

So it's not blind faith if you will and it's very contextual as well based on the experience of those users. We probably have time for one more question if there's any. Yes.

UNIDENTIFIED PARTICIPANT: It's (inaudible microphone inaccessible) how about the KVC - how about kind of what are the things that (inaudible microphone inaccessible)

ANTONIO PIETRI: Well I mean look, it's the current environment. Just plain - the current environment, there's hardly any spend on owner operators as leading to E&C work. E&Cs are still laying people off. We see the strength in the chemicals business, we still see the strength in the refining business, we see a very challenged upstream and midstream business, E&C business.

Now we're going to come here to the end of this yea. Will oil prices being at \$50 a barrel for six months and that's created enough confidence in our customers to budget for higher dollars which would lead to better investment or better spending in calendar '17? If that's the case, well hopefully we'll see the benefit but it's only then in the second half of our fiscal years.

So, you know, at this point ,we don't see any reason to think that the environment is going to change. It may but I think from a guidance standpoint, preliminary guidance standpoint we felt this was the right spot.

Okay. Well I want to thank everyone for trekking to Bedford, Massachusetts and visiting our new corporate headquarters. Hopefully this was useful and gives you better context for the company and we'll see you in the road. Thank you all.

KARL JOHNSEN: Thank you.

ANTONIO PIETRI: Thank you.

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