

## THOMSON REUTERS STREETEVENTS

# EDITED TRANSCRIPT

## GE - General Electric Co Digital Investor Meeting

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In this document, we sometimes use information derived from consolidated financial data but not presented in our financial statements prepared in accordance with U.S. generally accepted accounting principles (GAAP). Certain of these data are considered "non-GAAP financial measures" under the U.S. Securities and Exchange Commission rules. These non-GAAP financial measures supplement our GAAP disclosures and should not be considered an alternative to the GAAP measure. The reasons we use these non-GAAP financial measures and the reconciliations to their most directly comparable GAAP financial measures are posted to the investor relations section of our website at [www.ge.com](http://www.ge.com). We use non-GAAP financial measures including the following.

- GE Industrial operating & Verticals earnings and EPS, which is operating earnings of our industrial businesses and the GE Capital businesses that we expect to retain.

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## PRESENTATION

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**Jeff Bornstein** - *General Electric Company - SVP, CFO*

Well, good morning. Thank you for coming out here to San Ramon to hear our story around the transformation that is GE Industrial. I hope -- we're going to spend about three hours and then do some Q&A, and we're going to do a really deep dive here on how we think about the industrial Internet, and particularly Predix as an operating platform for the industrial Internet.

I just want to start with a couple of notions here. First, the Company has been under an enormous transformation over the last three or four years, really along three axes. One is portfolio transformation. So you've heard us talk about remaking the industrial portfolio, deep technology, focus on customers and solutions and we've taken a number of bold actions.

One is we just executed the appliance transaction a few weeks ago. I will go through some of the details around that in a moment. The GE Capital restructuring, significantly reducing our financial service footprint using the capital we free up as part of that to reduce our share count, return that back to shareholders. The team has done a phenomenal job. We're at least a year ahead of where we are and I will give you, at the end of this, a brief update on that.

And then the closure and the integration of Alstom, which we think is going to be hugely value-creative for the Company, particularly in our grid, our power and water business and some degree our renewables business, and we feel really good about the cost synergies that we've committed to all of you, and we're increasingly more confident about how we think about the growth synergies that the Alstom platform in combination with our own platforms and technology can create over time.

The second axis has really been a cultural transformation of the Company. We talked to you a lot about simplification. We're not going to cover that today, but how do you get a 130 year-old company, \$140 billion of revenue operating in 180 countries to operate with the speed and the sense of urgency that a much smaller company operates at? And digital is a piece of that as well. And so we've been very focused on simplification, pushing down authority in our Company, faster decision-making, etc., along with FastWorks and how we think about development, the speed with which we do it, the no-go decisioning that we're doing there.

And then, lastly, compensation is really aligning outcomes with behavior, rethinking how we compensate people and really trying to distinguish outstanding performance and how people get remunerated. The third is the digital industrial transformation.

And so we think we are positioned very well for this. We think this is the world's next source of productivity going forward, and we think asset performance, asset performance management is a killer app enabled by Predix. And that's what we are going to talk to you about today, and we're going to approach it from two perspectives.

One is the horizontal perspective, and that's the platform itself, the operating system itself, Predix and what we're building there, what the technology stack looks like, what it looks like edge to cloud, what the embedded micro services that enable people to develop real-time solutions on the platform and most importantly that deliver differentiated outcomes.

So at the end of all of this, if you don't have a plant that's more efficient, that uses less input to get the same output, or same input and more output, you're really not accomplishing anything. But we think -- and we're going to tell you some stories today of real customers using Predix and applications on top of it where we are differentiating the outcomes for these customers and creating enormous amounts of value, which we expect we can share in.



That's the power of the GE Store. Not one of our individual businesses on their own could ever afford to invest in what Predix is, the operating system. But we've got over \$1 billion of share in this effort, which is an enormous commitment to the space. But we'll build this capability that allows every one of our businesses to leverage that platform and then drive it vertically within their own markets, their own customer sets, through applications that really differentiate not just our products, but the outcomes our customers experience operating their businesses and their systems.

So this is a page that we've shared with you before. We're not new to digital, per se. The digital industrial and the operating system for the world is a much bigger swing, but in 2015, we had about \$5 billion of revenue in software applications, hardware, software-enabled upgrades, etc., and we believe in 2016 we're going to grow that to more than \$6 billion, and by 2020, we believe we'll grow that to something that looks like \$15 billion.

So the way I would describe that, we expect that \$6 billion to grow to \$10 billion or \$11 billion in 2020, additional applications, more Predix space than where we've been historically, additional upgrades, and this is delivering through our service franchise differentiated outcomes to our customers. We feel really good about -- and you are going to see a lot examples of those things today.

We're going to deliver as we rearchitect our own Company along Predix, which we call the digital thread, from design to services. Jim Fowler is going to take you through the component of digital thread today and what it means to us. We're going to generate, we think, on a run rate basis, at least \$1 billion of productivity in 2020 associated with deploying Predix in our own shop and against our own assets and systems.

And then the last piece is Predix, the operating system, which, in 2020, we think could be \$4 billion in revenue and extraordinarily attractive margins. And that's both deploying Predix, the operating system, to our customer base, but also deploying Predix to people outside our traditional operating base. And Keith is going to show you some examples today of other companies that are taking up Predix and deploying it against their own operations to drive differentiated value.

So this is not unique in terms of how we've thought about our service franchise over time. If you go back to the early 1980s, we were very much focused on growing the installed base, launching new products, putting hardware in there -- mostly a break-and-fix model -- get products in the field, figure out how to improve them over time, etc. In the 1990s, we actually for the first time started investing in technology in our services platforms, taking new technology that was developed and new generation of products and moving that technology back into the installed base to try to differentiate the performance for our customers, reduce the cost of ownership, improve the actual asset performance.

And then in the mid-1990s, we created what we call the long-term service agreement, or today we call it a CSA, which was really a breakthrough in industrial services where we change the risk paradigm with our customers, and we entered into long-term service agreements where we bore some of the risk associated with the cost of ownership of those engines.

And it also gave us an option to create enormous amounts of productivity not just for customers, for ourselves, and the profitability of these businesses has grown year in and year out for the better part of 15 years as a result of it. And today, we stand here with \$230 billion of backlog in our service business, which represents an enormous opportunity to drive and create even incremental value from here as we actually realize those revenues over time.

The digital industrial is just the next evolution in this process and the next evolution in the enhancement of our services franchise. We think deploying Predix, the analytical insights that we will get in our installed base -- you'll see some of this with Kevin McAllister today in our jet engine -- the insights we're getting into asset performance, not per fleet, but for a serial number.

What do we know about that jet engine; how it's performing; how it was configured; how we ought to treat that jet engine in terms of coming off of service, and when it comes off of service, what exactly we're going to do to that jet engine when it hits the shop. So a completely different paradigm and a completely different way of thinking about how we deliver both the service to the customer, but the cost we incur to do that.

And this is where the service franchise has been over the last 15 years. In 2000, we had an \$18 billion service franchise, profitable. That's grown to almost \$50 billion in 2015. It's on average grown 7% up profit a year over that period of time. It's advantaged by the success of our new product introductions. We have a growing installed base, and we think that Predix and the industrial Internet, the applications associated, is going to change the curve on what our services growth is going to look like into the future. We think we're going to grow faster. We think we are going to be more profitable as a result of the analytic capability that we are going to drive against our installed base and deliver for customers.

So why do we care about this? So we think, in 2020, the industrial Internet is going to be about a \$225 billion market. And just to put that in context, today, the consumer Internet is about a \$170 billion, \$180 billion market. The enterprise market, think SAP or Oracle, is about a \$200 billion market. So we think, in 2020, that's not that far away, the industrial Internet will already represent a bigger opportunity than what the consumer Internet has been as it's developed over the last 10 years, or the enterprise space has been over the last 15 years.



Now some think that's grossly underestimated. McKinsey would say, by 2025, it's \$11 trillion. They are a little broader definition. That's Internet of Things as opposed to industrial Internet. Whatever the right number is, it is going to be massively transformative for industry globally and we're going to play a big piece of that.

We think there's enormous value creation here for customers. Again, it's all about outcomes. If we create differentiated outcomes that enhance the franchise value of our customers, they get more output, more uptime, less downtime, real economic value creation, and we can participate in that value creation in a big way.

And it's going to change massively how we run our own Company, our own factories, the insights we get on how we build product, design product. In combination with advanced manufacturing factoring and 3-D printing, it's going to massively change both the design envelope of what we design and how we manufacture products and how we deliver service execution on a go-forward basis.

And I think that if we execute on all this and Predix ends up being everything we think it can be, it's going to change the relationship with our customers. I think the stickiness, the intimacy that we have with our customers is only going to grow enormously because we're going to be massively invested in the outcome of their own franchise. We're going to measure success based on them actually realizing incremental differentiated economic value creation.

So why GE? Well, first of all, we've approached Predix and predictivity from an industrial perspective. We didn't approach it from a cloud-based consumer net view or an enterprise view. We very much built the architecture around Predix, its capabilities, its micro services, solving industrial issues, solving asset performance. So it's a very unique perspective, one.

Two, you've got to have deep domain in the markets you play in, really deep domain, and you need to understand the physics associated with the machines themselves, critically, critically important. And you've got to have the right technology stack. Harel is going to take you through the technology stack of Predix. A lot of this activity is going to happen at the edge. It's going to happen where the machine is actually operating.

If you're running the grid in New York City, if you flying an airplane, you can't take data from the machine, send into a cloud, run a bunch of analytics algorithms, do machine learning, all that stuff and then send an answer back to the machine. At that point, the plane is on the ground and the grid has shut down the whole East Coast. This needs to happen in microseconds, so the compute technology, the algorithm technology, the deep machine learning technology, a lot of that is going to actually happen at the edge.

That's a completely different technology stack than what you see today in the consumer Internet, it's a completely different technology stack than what you see in ERP and enterprise. And I think we've figured that out and we think that's a huge advantage.

And then cyber security is obviously absolutely critical, and Harel will talk more about that.

We didn't just start this. We've been at this since 2011. Every day we get more confident about what we're doing. Every day we become more convinced that this is absolutely what's going to change the world.

For the last 15 or 20 years up until 2011, the world enjoyed about 4% productivity growth, and that's the source of 3%-plus global GDP if you do the math. Since 2011, the world has enjoyed 1% productivity growth, and so the world shouldn't be surprised when we only see 2%, slightly better than 2% world GDP growth. This is going to be the next source of industrial productivity, productivity generally that's going to drive global growth, and we absolutely believe that.

So with that, I'm going to turn it over to Bill. We're going to talk about the horizontal first, the platform that we're leveraging across all our businesses and for the world, and then we'll do a deep dive into a number of the businesses on what the vertical application with real customers looks like and how we're actually starting to change the game. Bill.

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**Bill Ruh - General Electric Company - SVP, Chief Digital Officer, CEO of GE Digital**

Thank you, Jeff. So great to see some of you again and to meet some of the rest of you. So I joined GE five years ago; I came from Cisco. I've worked at a number of tech firms over my career, big and small. And I view this as probably the next big thing. And I think over the last five years, we have done a tremendous amount to really build out and prove out that this truly is starting to take hold in the world today.

As Jeff pointed out, this productivity thing is really important because it's an indicator of a number of things. The first indicator is, look, industrial companies are going to have to do something. You can't just wait it out. If your strategy is that growth of the world's economy is going to turn this around, I think we're living in a slow-growth world, that can't be it. So you really have to look to two things. You have to look to the idea that you're either going to make yourself more efficient, or you're



going to use the technology to deliver new capability to your customers and open up either adjacencies or expand your markets and we think that when you look at it, that's what people are going to have to do in the industrial world for the next decade.

And when you think about it, how are they going to do it is extraordinarily important because process and the ability to improve process has run its course. If it hadn't, we would have seen greater productivity. The second thing is the technologies we've been using for the last decade to automate are no longer good enough to get you to where you have to go.

The second thing that's important is digital technology has gotten to a point which it's actually enabling this in a new way. So if you think about where technologies like machine connectivity are at today where we see the idea that machine learning, AI, coupled with physics-based modeling have gotten to a point that are very interesting. Moore's Law has brought the hardware to the point where we can do things in software we couldn't do a decade ago.

So we are at a point where this new technology is going to allow us to do things we never did before, and we think the center point of this is this idea of a digital twin, which you'll hear a lot about today. And the idea of a digital twin is simply this. You learn a lot about AI and machine learning today in the world; you hear everybody talking about that, and we actually see that as a very important part of what we will deliver to our customers.

And what that does is it tells you everything that's happened in the past and gives you insight to when it might happen again. But we also know the power of physics-based modeling, which we've been doing for multiple decades and most industrial firms have been as well, but when you look at what physics-based modeling does, it actually tells you what is going to happen in the future, which artificial intelligence does not.

So the idea that we can couple looking at the past for patterns of behavior, coupled with looking into the future and looking at thousands or even millions of options to find the best one to accomplish your goal and combine those two, we think it is going to be the center point of value in the digital world.

Now the other thing that's important on this slide, and the reason I'm spending a lot of time, if you walked away with one slide in mind, I think it's this. There's this opportunity and the technology is here, but more importantly are the principles there because these principles are what we are doing, it's how we view the world and why we win. And those are things like it's not about selling technology. What you're going to hear from our team today is that we focus not on telling someone here's your technology, but on delivering outcomes and that's what we sell and you'll see more on that.

The second thing is that we are going to talk about why the consumer Internet and IoT is different than the industrial Internet, and the technologies there are quite advanced in terms of need to process at the edge. And Jeff alluded to this as well, and we're going to talk a lot more about the edge. Sometimes people think industrial companies can't bring in the talent. I will tell you this, that I think when you think about talent, talent goes to the best ideas and the next thing, and I think this is the next big thing. And so there is an ability for industrial companies to attract talent to do this.

We also see the idea that people with assets are in the best position to capture the value because they can determine what kind of data comes out, and data is the water rights to the valley. It determines what kind of insights you're going to get from your analytics and your physics.

If you are really going to be in this game, you've got to be committed to building your own digital content, not just your own machines, but your own digital content. The best industrial companies in the future will be doing this. You have to reform your IT. You have to bring the IT into the fold. You have to make it part and parcel of your old digital capability, and we've done that.

You have to really think about simplifying your culture and your bureaucracy because if you are going to attract talent, talent is going to want to come to places that feels a little more fast paced, and the ability to move fast is a key element of what we have had to do to develop the kind of company, the digital industrial company we want to be.

And the last thing is we believe that this is a game for industrials to play. And I think the reason we do is industrials trust each other. I think some people might say: Well, why would industrials buy from other industrials? Well, the fact is industrials have been buying from other industrials for multiple decades and generations. We all see to each other. We all interact with each other today.

So this is nothing new. So when you look at it, these are at the center point of why we think we can be the leading digital industrial, why we can win with Predix and why we're making this investment.

Now I just want to take you through a few other thoughts to level-set you on where we're going. But the fact is the rest of the presenters are going to take you through the details and the proof points behind everything I'm going to talk about.



What we've learned in the last five years -- because, five years ago, we didn't really understand it in the depth we do today -- but if you look at what we've figured out is that it's not just about the AI and machine learning that is the most important. We think that is critically important and you can see advanced data science is a key part of what we think it takes to win. But, as I mentioned before, what we've learned is that only tells you about the past. What we also know is that when you combine it with your traditional physics-based modeling, that's what's going to tell you about the future. Those two things combined together are really powerful, which means you have to have domain knowledge because without domain knowledge you don't do physics-based modeling.

The last thing is the ability to apply your own engineering talent both to deciding how you rebuild your products with more data, with the right data. We decide that. We are in control of our destiny of working with our products to bring out more data. Also, our engineers in the field provide us with insight that no one else can. When you combine those three things together, that is a winning and powerful combination.

The other thing we've learned over the last five years, when you combine that data with the statistics, with the physics and build an application, the application is best-suited when you focus on an outcome, and at the end of the day, you can simplify this. I want to either be more efficient with resources or generate more capability or be safer. Those are the three basic outcomes everybody in the world wants, use less fuel, generate more electricity, keep my people safe and when you combine that, those things together, and show it as an outcome, customers buy outcomes. And you are going to see our customers are buying outcomes.

Now Jeff talked about this idea of the industrial world as being a huge opportunity. We're seeing a lot of numbers. You'll see how we think we're capturing that today. I would make one other point, which is we believe there are going to be three markets. There's going to be a consumer, an enterprise and industrial market. This goes to who is going to compete in which, and in each of those markets, the cloud mobile technology is going to mean that there will be a few key platform providers in each, and I think you have to decide is there going to be one platform provider for all of this stuff, or are each of these going to be unique companies. And then we're going to see a lot of applications in all of these areas.

Now we think that if you look in the consumer world, you know, you see the Googles and the Apples, the Alibabas who have created platforms that others are coming onto, and we see that world as one where they get very good at the home, they get very good at the phone and they get very good at the auto, potentially. We think that the enterprise is different. These are companies who are taking your traditional ERPs and providing them in a new way that allows you to get up and running at a much faster rate at a totally different price point.

And of course, we run our operations ourselves on this capability. But we don't think any of these translate over and we think that there will be this third world, the industrial world, where there will be platform providers and application providers and that this world we actually see as bigger and actually much more global in perspective than any of the others because when you look at infrastructure buildout in the world today, the emerging market buildout is huge.

I think this idea of consumer versus industrial is something that everyone has to really begin to think about and the consumer world move its way over to the industrial world. And we think that there are three major differences that these points point out. The first difference is in the machine. The second difference is the security, and the third difference is in the cloud.

Look, in the consumer world, the assets themselves are fairly superficial. Look, I got the idea of connecting to a thermostat, or connecting to a watch, or connecting into those kind of devices, but the reality of those devices is that you can have less reliability and you don't have the real-time nature that you do with a utility plant, or with a factory, or with a fleet. The fact is that the data volumes and the criticalities of the machines require a different kind of capability than need in some of the consumer or the enterprise applications.

The second thing is the security is totally different. The idea of how you're going to secure a power plant, machines in a power plant, is different than what you do to secure the cloud and secure data centers, and quite frankly, in the consumer world, the security is managed by the user, not by the whole system. And if you are going to be in the industrial space, you are going to have to be at a totally different level of security.

Then when you look at the cloud, what makes the cloud different is, look, in the consumer world, we give our information away for free in exchange for value in a different way. But that is not going to happen in the same way in the industrial. The industrial world, the companies will want to own and monetize their data in a different way. They aren't necessarily seeing that all their data goes up into the cloud like in the consumer world. Our customers want to see a lot of their data living close to the machines in the plant, in the factory, in the field.

And it's not just the cloud world. It's the cloud to edge world. And you're going to hear this over and over for us, that we have to think about compute at all levels, at the sensor, at the machine, at a gateway that incorporates a whole set of assets and even the ability to move the cloud closer to the machines and then the cloud itself. So when you think about the cloud architecture, it's different by its very nature in these industrial settings.

Building blocks that you're going to -- we're going to talk about a lot of terminology today. These building blocks on here are the ones I want you to really walk away making sure you understand because you are going to hear these terms over and over. But the thing I want you to understand, our building blocks and our focus is three





things. We focus on outcomes. Our applications are all outcome-based. What are we going to deliver? We're saving you money. We're making you money. We're making you safer. That's what we're talking about.

The second thing is the technology. We are creating our own technology and working with a lot of partners at horizontal technologies where we feel that that isn't something we need to create. But we are building a lot of technology and I want to talk about the kinds of technology we are focused on investing on.

The last thing is talent and culture. I want you to understand that you have to build the right kind of environment to be able to build these kinds of systems. This is actually what has made these Internet giants great is they've got the right talent, they've got the right culture, they've got the right skills and processes to be able to do this, and if you are going to be good at it, you have to invest in it.

Now when I think about outcomes, the things I want you to understand, our focus is on asset performance management. This is the center point of what we do. Others have other kind of center points that they think about. So for example, PLM is a different center point. We have focused on asset performance management where we make the asset the center point of all the software we build. So you're going to learn a lot today about what we mean about asset performance management, and we see this as our first killer application into the market.

All of this is being delivered as a service because when you deliver outcomes, people want to see it as a service. And from the enterprise perspective, we think of things like plants, fields, factories, fleets. That's what we mean by enterprise. You have to be able to not only do your own equipment, but a customer cares about the end result of all of their equipment brought together.

So when you think about outcomes, we are talking about all kinds of equipment, our own, all varieties and vintages, being able to be managed as an asset. And by the way, we do those with partners because this is a team sport.

Second thing on the technology, we're going to talk about Predix. Now Predix is an operating system because it is not just a cloud platform. Cloud is a part of it, but it goes from the edge to the cloud, and so we're going to talk a lot about edge processing because I think you need to understand why that's important. So edge devices are a critical part of what we're doing, and we don't see one edge device. We think there's going to be a proliferation of edge devices and a lot of the traditional proprietary edge devices are going to be displaced and replaced by other kinds of boxes, and what's going to happen is we're moving into a software-defined machine world where the software will be the critical part of what happens at the edge.

Digital twin, I've talked a little bit about this. This is really what underpins asset management. It's machine learning, coupled with physics-based modeling that allows you to see the past and predict the future simultaneously. Digital Thread is the ability to take that and run it from engineering through services and operations and optimize across rather than the silos that we've typically done in the past.

The other thing you're going to learn a lot about is cyber security. Look, at the end of the day, cyber security is the number one question we get asked. Is this secure? And it can't be managed by the user. It's got to be a full system, and so we'll talk a lot about where we are with cyber security.

The last thing you're going to hear a lot about is how talent and culture matter. Look, at the end, we've had to blend domain knowledge with digital knowledge in a way no one else really has before. This is the litmus test for whether you're a digital industrial. You should be looking at every industrial firm and you can determine this by seeing how well they have made this happen because you can't be a digital and an industrial. You have to be digital industrial.

So we have been working to blend those things together, retrain our people and you'll see that today with a number of the presentations. Tech skills are tremendously important. And then, finally, how we deliver this using Agile, using the kinds of techniques that have made Silicon Valley great. We're moving into a world where speed matters, continuous delivery, Agile skills, these are the kinds of companies we're creating today, and so these are the building blocks, and if you take this and look at it, this will help you understand everything we're going to be talking about today.

Finally, a couple of points about how to think of us in comparison to the rest of the world. Look, you're going to go and talk to -- and you already do -- everybody talks about IoT. First of all, we think of the industrial Internet as different than IoT, so we think about how we're going to make a power plant more efficient, our language is different, the technology is different. But with that said, everyone recognizes this opportunity, so you can talk to all these folks and every one of them will talk about the idea of the opportunity and how they think they play in this opportunity.

So the fact is this is going to be a very interesting world for the next few years as we figure out how all this plays together. I want you to think about it this way, and this is how we view the world. Look, most of those folks come from four different viewpoints: they are an automation company; they're a cloud, generic-cloud platform company; they're a system of record company; or they're an analytic tool company. And when you look across them, that's the perspective they come from.



We look at it at Predix as recreating from scratch an industrial operating system, not taking our pre-existing system of record capability or our pre-existing automation capability, but building from scratch a next generation. And the reason why is, look, if these things worked for the productivity, we would have seen productivity go up. We think you have to reinvent this to get to the productivity gains. So for us, Predix is, you'll see, a buildup of this in a totally different way to deliver digital skills in the same way we might have seen the consumer Internet happen.

I also want to point out when you look at all these, we actually look at all these guys as partners, and in many cases, you're going to hear from Kate Johnson about many of them we have already partnered with because that's -- the key is that these things are still important, they are just important integrated together for our customers.

So when you look at competition today, we think that we are the first with an industrial operating system out into the world today, working with our customers and all this technology to integrate it together. And that then translate into what makes us different and how we are investing and focusing our efforts. One is on domain knowledge and scale.

Look, if we look at ourselves, our ability to take our domain knowledge, which I've hit on a bunch of times, is tremendously important. This is going to be a differentiator. Lots of industrial companies have domain knowledge so they can bring it in as well. Scale is important in that we are global and this is a global game. Look, industrial is happening outside the US and we're seeing this even in the kind of companies we're working with from the beginning, and we will deliver hundreds of applications to the market using that domain knowledge and you'll see that from our businesses and how they are driving growth for themselves.

The second thing is we have a digital industrial platform. We think it's the first digital industrial platform with asset at the center. APM is the center point of this, and when you can look at us, we judge ourselves on having thousands of GE and partner apps on here delivering values to our customers and you should look at the progress we've made to date in getting those kinds of people on. And we think that this is going to differentiate us because we have first-mover advantage. We're the only one that we think that has the asset performance management focus and the platform out today, at the edge, all the way to the cloud.

The last thing is you've got to be willing to partner. You cannot deliver this by yourself because the integration is tremendously important. So for us, we want to have hundreds of partners and we expect to have 50 partners on board by the end of the year -- we're judging ourselves on that -- and at the end, hundreds of thousands of developers on the platform building capability from those partners.

So these are the three things that you can look at and say how well are we making progress? Are we building the applications? Are we applying our domain? How good is the platform? Is it focused in the way I said around asset performance management? Are we building the commercial ecosystem and making progress? Those are the things we think we are focused on against -- as the competition emerges.

Finally, from an organizational perspective, I leave you with this. Jeff describes this and Jeff described this as it's a company within a company. It's got the nature of GE Digital, a horizontal business focused on selling Predix and APM out to the market, and you're going to hear about that; but it also means we have to a digital inside every one of our businesses.

If you pull it out of the businesses, you lose the scale, you lose the customer focus. So we have to leave it in there.

We have to create chief digital officers who are driving it with the businesses, and those chief digital officers in the businesses report to me and they report to the CEO. That's not as clean as you like. It's a matrix.

But guess what? That's the only way to make this work where you get to leverage scale and domain knowledge simultaneously while you are building in and building digital capability. So for us, it's not business as usual in creating this GE Digital.

And that's okay because you've got to lean into the hard work. I would tell you this. If you look out in the market and you say, well, some people create a digital unit and they create it to the side, how many of those have actually built sizable businesses by incubating it that way and not leveraging their scale. So we think if you don't choose to be a digital industrial, you cannot win this battle.

So that is our thesis. That's what we believe in our heart. We are all in on this. This is how we are going to market. These are the things we're investing in. This is how we're organizing ourselves, and we think we've done that the right way. What you're going to hear now is from the people who do the work, the people who have this content. And this is about one-third of this leadership team across GE that's driving digital. And you're going to see a lot of people who are new from the industry on the horizontal side dealing with Predix and APM and how we're going to market, and the partners and so you're going to see a lot of people from the outside coupled with people from the inside GE, blended together, making this happen.





We'll also talk from the business perspective from the Verticals. And again you're going to see new great talent like Ganesh Bell, Seth Bodnar, who bring digital talent from the outside, coupled with people who are deep industrialists who have become digital leaders like Kevin McAllister. The idea that we're taking these kinds of leaders who are industrial and making them digital, you judge whether they are leading the way in digital.

So with that, I'd like to turn it over to my friend, Khozema Shipchandler.

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**Khozema Shipchandler - General Electric Company - VP, CFO of GE Digital**

Great. Thank you, Bill. So my name is Khozema Shipchandler. I'm going to take you through a little bit about how we define success. Obviously, with 20 years of experience at GE, I'm one of the less new folks that you're going to hear from over the course of the morning.

The way that we think about success, I'd really like to focus on leading indicators. There's two in particular that I will focus on today in terms of the way that we think about the way that we're gaining marketplace traction that ultimately, obviously, leads to financial success.

So the two that I'd like to focus on, one is developers on Predix. The second one is partners. So as you think about developers, we launched this platform in February. It went general availability. We're targeting 20,000 developers by the end of the year. We're at about 10,000 year to date, about halfway through the year even though we launched the platform a little bit into the year. So we feel really, really good about the progress that we're making in terms of the developers that are signing up for the platform.

At the same time, Bill alluded to we're really trying to build out this partnership network. We're targeting 50 partners by the end of the year. We've got 31 already signed up to the platform and we're pushing probably well above 50 at this point. The relevance of those two metrics is that really what we're trying to do is develop an ecosystem that's actually going to be the growth engine behind the financial success that we think is going to follow behind these leading indicators.

And when you think about what happens here is that you bring developers to the platform, you have partners that extend the capability geographically into new Verticals into the Verticals that we're already in today and you combine those with customers, that's how you drive innovation, how you drive stickiness to the platform and ultimately how you create this growth engine, which will ultimately house thousands of applications that are going to generate customer value.

Now, at the same time, we are investing at scale, and quite frankly, we're investing to win. This is not all that different quite frankly from what we did in our services franchise about 20 years ago. 20 years ago, we made investments very similar to what you see on this page, and today, our shareowners are enjoying the returns that are made off of those investments that were made.

Similarly, we're investing about \$1.4 billion this year in different kinds of capabilities that we believe are required to win this battle. So if you think about the different areas that we're investing in, the way that it breaks down, we're investing in the Digital Thread. You'll hear Jim Fowler talk about this. It's about digitally connecting our factories. It's about enhancing our capabilities in engineering, in services, in manufacturing and commercially.

We're investing in vertical capability, so our businesses have R&D efforts of their own where they are developing extensions into what we do horizontally to develop and enhance the capabilities that are much better suited for the custom applications for their businesses. And then at the same time, and we'll spend a lot of time talking about the horizontal in the first half of this, we're developing horizontal capabilities. We're spending nearly \$700 million developing Predix, the operating system, developing applications, developing cloud infrastructure -- has to have hardened cyber capabilities -- and then developing it all for the edge.

And the paybacks are pretty good at the same time as well. You'll get \$0.5 billion of productivity, which will drop straight to the bottom line. At the same time, we're also generating about \$6 billion plus of revenues, and we feel like that's a pretty good payback based on some of the investments that we've already made, as well as investments that we continue to make in the current year.

In terms of one of the leading financial indicators as this all rolls up, we've communicated earlier in the year that we expected about \$6.7 billion of orders. The way that we look at it today is that we are pushing slightly above \$7 billion and so we see consistent market momentum behind our efforts.

If you look at the left-hand side of the page, what you can see is that very broad-based contribution across all of our businesses, all of them pushing more or less 30% plus across the franchise. At the same time, the one notable exception obviously is healthcare. We're rebuilding our healthcare portfolio. You're going to hear Charles talk about a lot of the exciting things that we're pursuing there, which ultimately will yield a 10% growth target for next year.

At the same time, if you notice the bottom line there, digital core, growing well in excess of 100%. So this is really expansion into new Verticals, new markets in which we've traditionally not participated, and this thing is really taking off fantastically globally. The honest truth is that we're actually growing faster right now outside of



the US than we are actually in the US, and our partners in this overall ecosystem that we keep harping on is really what's helping us expand our reach. And so we have a great foundation that we're building from and really we're trying to put every one of our businesses on a path to growing into a \$1 billion franchise on their own right and feel like we've made pretty good progress to get there.

In terms of the way that we generate revenue, there's a number of different models that are at play here. We're experimenting with a few new models and then there's some that you are going to be familiar with. And we can do this in one of two ways. We can do this through the existing services franchise, and at the same time, we can sell these services on a standalone basis.

So let me give you a few examples. So upgrades. This will be something that you are pretty familiar with. An example would be the advanced gas path upgrades, AGPs, that we do. This is hardware, which is fundamentally software-enabled. It allows us to enhance the value of a customized service agreement, or another kind of a service offering.

At the same time, we can do a standalone deal. What a standalone deal would look like -- we would do a rev share. This is where a customer -- and one example would be Exelon -- would develop an application; that application would be either developed by themselves, developed jointly with us, potentially developed by a partner. That application would ultimately be hosted on our operating system. They would derive revenue themselves, and at the same time, we would take a cut of that revenue thereby deriving our own value based on an application that they develop.

We can sell licenses. We can sell in a traditional software model, probably something that you're more familiar with on a subscription basis that can be GE-developed applications, third-party developed applications. You're going to hear a lot of examples this afternoon -- during the course of the morning -- that are outcome-based where we target a specific customer outcome and then based on our ability to achieve that outcome, we take a share of that value.

And then, finally, you're going to hear a lot in a moment about Platform-as-a-Service, and so this is our Predix operating system in which we have embedded micro service capabilities, and which people are actually using our operating system to derive value, develop applications and ultimately use data. And there's a variety of others that we're using at the same time that we constantly are trying to experiment with fundamentally to generate the most value for our customers, and every single one of them is generating incremental value for the share owner.

In terms of the way that we ultimately create future value for the Company, this is the way that we look at it. So today, we are about a \$6 billion digital business for 2016. That's built on the back of very strong software, professional services that helps implement that software, the operating system, Predix, that we've been talking about and digitally-enabled outcomes, like AGPs, and then productivity solutions that generate outcomes for our customers.

You heard Jeff talk earlier about the ways in which we dissect the value that we're going to generate, productivity, applications and upgrades and then the operating system. And you can see the way that that breaks down in the current period. By 2020, we believe that we can grow this into a \$15 billion franchise. Productivity we feel very, very good about being able to generate \$1 billion on run rate productivity annually by 2020.

In terms of applications and upgrades, you've heard us talk about it a few times. Asset performance management is the cornerstone application that we're really trying to push value with. At the same time, we have additional applications built on brilliant manufacturing, as well as automation. We have cyber capabilities and we're constantly developing new applications that deliver new value.

And then we have Predix, the operating system, which we believe ultimately can deliver value not just within our current Verticals, but for the industrial Internet at large and ultimately generate \$4 billion off of that platform with very, very rich margins that are associated with that.

So as we think about where we are today and growing that out to 2020, we see a very, very strong trajectory to hit \$15 billion with very attractive pushing 30% plus operating margins, which are ultimately accretive to our bottom line.

At the same time, we are making some investments to accelerate our efforts, and so there's a variety of outright acquisitions that we've done, as well as equity stakes that we've taken in companies. I thought I'd give you two examples to maybe illustrate the point.

So Pivotal. Pivotal is a company in which we have an equity stake. What they do is they provide infrastructure capabilities that allow us to run our Predix operating system in a more constructive way. It also gives us access to domain and technology, as well as technology and developers themselves, very, very attractive for us and a good partnership arrangement with them.

At the same time, if you jump down to the bottom of the page, we have great cyber capability. We bought this asset called Wurdtech several years ago. These are capabilities, they are signatures that allow us to protect our products. So this is different from network infrastructure, but actually allows us to protect a gas turbine or an



aircraft engine using cyber capabilities that we own ourselves that enhance the Predix operating system, as well as allow us to protect our assets that we're deploying out in the field.

We're constantly evaluating whether or not we want to take on new investments. There's a variety of considerations that go into it, but fundamentally what this is going to be governed by is ultimately speed to the market and whether or not we can develop a differentiated capability on a build-versus-buy basis, and we're always going to be looking at enhancing the technology stack, delivering new applications and growing into new adjacencies. And we will do different investments to enhance those capabilities.

Finally, I just thought I'd touch on the cultural change required here. Again, I'm a 20-year veteran of GE. I'm a classic mold. I came through our leadership programs. I spent a lot of my career in the aviation business. Ultimately, I was the CFO of Aviation Services. I was out in the Middle East for a little while serving as the CFO of the Global Growth Organization out there, and then I ran the corporate audit staff before taking on this role. And I can tell you quite frankly that this is the single most exciting endeavor that we've taken on as a company, at least in my career.

It's completely energized the entire Company. Things like Digital Thread and Predix, they are just examples, but they are two of many that are fundamentally demanding a complete transformation of the way that we run the Company. The strategic stuff that we're doing with our customers, it enhances value that we already have and it's delivering outcomes in a much greater level than what we've ever had before. You are going to hear from a lot of external, as well as internal speakers, and I think it's that unique marriage of capabilities from both sides that's really going to be what allows us to ultimately do this.

We're operating with a new sense of urgency, efficiency, simplification. We're investing in a very profound way, and we're unafraid to experiment. If a couple things don't work out here, we will shut those down, we will move on, and we will keep going. And then finally, I really believe, having been here for a long time, that GE is uniquely positioned to do this.

We've talked about a variety of our killer applications, but the overarching killer app in this is our domain combined with our analytics and there are very few companies that have the wherewithal to be able to pull this off. So with that, I'd like to turn it over to Harel Kodesh, who is going to talk to you about technology.

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**Harel Kodesh - General Electric Company - VP, CTO of GE Digital**

Thanks, Khozema. I am not a 20-year veteran of GE. I joined GE about less than two years ago. I spent most of my career in companies like Microsoft. I ran the mobile division for them. EMC, I ran the cloud division, VMware, large companies, smaller companies, etc. I spent most of my career as a developer and if you're like me, this is the hottest party in town, and I will try during the next 20 minutes to convince you that this is indeed the case.

This is not a theory. We onboarded most of the Siri infrastructure team from Apple over the last couple of weeks and they told me exactly the same thing, they would come here to do things that do not exist today, that the world needs them and they have cool people to work with. And as Jen talks to you about HR and our challenges, you'll see that we are solving this problem not just by asking the experts at GE to help us build a new software system, we bring everybody that can help us.

The second point I'd like to make is if we look around what's happening in Predix or in the business today, we are not too proud to take everything that we can take from the open source community and actually give it back. Spark, Kafka, databases, but we also realize that to solve the problem that you see on the screen now, we need to have quite a few new technologies and new tools and I will cover them shortly.

So the problem that we have, the challenge that we have is that we haven, on one level, we have devices that generate unbelievable amount of information, orders of magnitude more than what you get in Facebook and others. At the same time, we want to make sure that we can process the data in the right place, taking all the data, move it to the cloud willy-nilly consumer Internet style. And giving back the result is not going to work. There's just too much data.

So what we want to do is we want to make sure that we find all the compute nodes between those devices and the cloud and we process the information at the right time wherever we need that. So this is one thing.

The second thing is that we have to make sure that we are complying with data sovereignty rules. The world is getting more and more concerned about those devices that we call our assets, but other people call them critical infrastructure -- trains, jet engines, turbines and so on so forth. So countries are enacting more and more rules to make sure that data doesn't leave the country. That puts us in an interesting predicament because the idea is that we would like to look at the whole amount of data, but at the same time we have to make sure that we drop data centers in countries that are not allowing the data to leave that country. And as a result, the whole idea of building hyper scale data center, the same way that most of the consumer and the enterprise Internet providers are doing is simply not going to work. It's illegal.



We want to make sure that when we approach the machine intelligence or machine learning algorithm, we actually take the best of both worlds. We take our physics-based model, the knowledge that we have about our machine and the knowledge that other people have about their machine and combine them with super advanced machine learning algorithm that will allow us to interpret the data and analyze the data even when we don't have an idea how to build a physics model for that specific device. And this is very different than anything else you'll see in the market.

We need to make sure that, at the end of the day, we also have an open ecosystem. So we're not the only one that are building, that are plugging the holes. There's actually more holes than cheese in the system and that's exactly how we build it because we want the community, the open source community, our partners, sometimes our competitors to put their devices, to bring everything that they have onto the system. Predix is unlike any other cloud-based operating system that you've seen in the market, and it is an operating system because we are taking it outside the private use of GE and putting it out in the open.

So I said it's unlike anything else that you've seen, and these are the three major components of the difference between anything else that anybody is putting there, and people would argue that the Internet is an Internet is an Internet. I would beg to differ and these are the three reasons why.

First, we need to have semantics. We're building actually a grammar or ontology for assets. So we're talking about an asset-based economy and asset-based compute platform, and that means that we have to be able to take parts and aggregate them into subassemblies, aggregate them to assemblies and actually build a digital picture of a locomotive or a jet engine or a whole plane or a whole city. And so it covers all the way from the turbines, and it should cover the spectrum from the turbines all the way to the Tesla that is connected in somebody's garage because that's the only way that we'll be able to query that much information and understand what's going on. So as we go and electrify the world, this is exactly what we need to build. Nobody has that. It's very difficult because the scale is unbelievable.

The second thing is that we want to make sure that we have the ability to build the right data centers, and as the folks that are working on data centers told me, it's one thing to build a hyperscale data center along on the likes of what you see in Quincy, Washington, Amsterdam and so on that stores a lot of pictures. But if you go to certain geographies, they are not big. You still want to make sure that you build a data center at the maximum amount of efficiency in such a way that you'll be able to get the information processed in a way that cost is not prohibitive.

And you want to do it in a secure way. You want to make sure that everything else is secured because unlike again the downside of bridging into our system is much higher than anything else that we see in other areas.

And the last thing is our machine learning. Our machine learning is different than anything else you've seen. Everybody is talking about recommendation engines and so on, but let me give you an example. If you go and buy a book from Amazon, they will give you a recommendation. The book is about \$9.50, so there's so much money they can invest in recommending you the next book. And if they recommend you the next book and you look at that and you say, well, but I've read the book, I don't like the book, no harm, no foul, you move on. You don't give it a second thought. It's a nice-to-have tool. Sometimes they hit exactly what you want and you get amazed by that, but, at the end of the day, this is an interesting value proposition.

If we give you the same recommendation and we have what we call the false positive, we tell you to take an engine off the wing and go and service that because there's a problem with that, and then you take it and you open it and you realize there is no problem with that, you lost quite a few thousands of dollars because the recommendation was not exactly what you need.

So our machine learning algorithms are different in a sense that, A, they have to be really good on what we call the false negative, telling you that there is a problem or not missing it, and also the false positives, not telling you when there is a problem, there is no problem.

The second thing is because of the associated costs -- the costs associated with those things, we want to make sure that we can actually run a more expensive flavor of the algorithm. So in a way, we are spending the money wisely on running let's say 100 algorithms at the same time to make sure that we can look at all these predictors, aggregate all of them and give you a well thought through answer that is a combination of our physics model and at the same time those many, many algorithms that run in parallel. They take a big chunk of compute resource, but, at the end of the day, the answer is going to be much more planned, much more thought through and the machine learning algorithms are going to work much harder on that.

Bill mentioned the edge, and the edge for us is super important. This is -- think about not a single windfarm and not three turbines, but hundreds of wind farms and thousands of turbines. As they take the data, and the data that is spitted out of these things actually happens every 10 microseconds, so there's a huge amount of data that is generated by those devices. We want to make sure that we optimize the compute power or the place where we run those workloads and put them in the right place.

The closer you are to the device, obviously the lower the latency is going to be and the higher the price is going to be because we run very small-scale controllers next to the device. The cloud has an infinite amount of compute and storage and the price per bit is practically zero, but the latency is much higher. So we want to make sure that as the data starts going from the device towards the cloud, we process it wherever it makes sense.



We do some pre-processing in the controller. We do even more pre-processing and normalizing at the gateway. We go to Predix box that reflect the fact that people would like to have some level of insight within their premises because they may not trust the cloud availability all the time. If you're a grid company, you wouldn't trust the cloud to be available where the grid is not available. And so what we do is we can move those workloads dynamically between one place or another.

If you compare it to other types of IoTs, a refrigerator that tells us that you need milk, Fitbits, etc. This is -- you don't have the network operating like that. You have a much simpler network, usually it's an appliance, a Fitbit, let's say, your phone and then the cloud. You don't have that many layers and the amount of compute that you need to apply is not that high.

So the name of the game here is to make sure that we execute the compute wherever it makes sense. You can develop everything in the cloud, but then you would like to run the blowup preventer next to the drill because nobody else is going to take it any other way.

So the ability to play in edge, to play the edge devices part in that is super dynamic, is changing all the time, and the amount of data that is created is so high that we have to start chopping it way before it gets to the main arteries of our data fabric.

All those things -- the security, the digital, the machine learning, the edge economy is coming to play when we talk about digital twin, and our digital twin strategy is somewhat simple. We commit every single asset to cyber. So we build a twin of everything that we build, every single physical appliance. So when you think about a jet engine, when it leaves the factory, you have a lot of information about what it is, how it looks like, what was the engineering consideration, how far was the freezer for the composite material from the actual milling machine. All that information goes into the definition of what the engine is when it leaves the factory.

But then during operation, interesting things start to happen. We're not talking about just a generic jet engine, GE-90; we're talking about a specific jet engine with a specific serial number that operates on the right wing of a 737 with that tail number. That plane is flown by different pilots. It goes through different pollutants in the air because it flies different routes than another plane, then another engine with another serial number. So over time, the functionality of those devices starts to diverge and as a result, the maintenance regimen, the recommendations about what to do with that are really depending on all the events that that specific device has gone through in its life.

And as a result, we can pinpoint the specific recommendation with our machine learning algorithm, with the data that we aggregate and it is different from one specific engine to another and come up with different answers. That optimizes our ability to maintain and operate those devices and everything else is actually boiling down to the fact that we're not running a fleet, a P&L of 100 assets. We're running 100 P&Ls of a single asset each, which is an ability to really optimize everything else that we do with that.

This is not limited to the industrial space. It goes to healthcare also, so when you think about this, we start to capture the specific aspects of patients and as a result of that, we can move forward with individualized medicine and ability to really deal with the specific blood samples, DNA and everything else that can fit every one of us and come up with a different solution for each patient based on their needs.

I won't go through the slides. Let me just take the -- or through all the scenarios in the slide -- let me just take the second row and tell you how we will look at things when we have a problem to solve. So that problem is early warning. You have a device. It's running. If I can give you a warning that this device is due for maintenance 60 days before scheduled maintenance, I can do many more things than if I tell you the device is about to crap out in an hour because then you have a problem of unplanned downtime, which is what we are trying to solve.

So if the device is an engine of some sort, we can use the physics model. The physics model goes into what we call numerical propulsion simulation system, NPSS, and we take all these equations that govern the heat, the pressure, the operation of the device and we can come up, just by running the equation, come up with an interesting recommendation. But in many cases, some of the subassemblies cannot be described, or we don't know exactly who they are, or if they actually belong to a partner that for some reason didn't go through the definition of the equation.

And this is where we unleashed the power from machine learning, so we take all these algorithms -- on the fly, we create the features, we create the actual understanding of what's happening with the data and those algorithms -- and I said we run sometimes hundreds of them in parallel just to make sure that we have the right predictors -- these algorithms together with the physics-based model spit out an answer.

And this is the answer that we use and we are comfortable that the answer has been looked upon from so many directions and with so many algorithms that this is actually the best answer we can come up with. And that allows us to actually move the ability to understand what we're operating in a way that was never done before, simply was not done before because nobody, as I said before, nobody can put that much money into the algorithm because they really have no reason to.



Jeff and Bill talked about asset performance management, or APM, and for us, this is really one of the golden apps. This app is not just an app; it's also a service. When we talk about microservices, those services are created by the micro team. They are being done dynamically. We release upgrades and changes to them every several hours. On the average, we spit out an update to Predix every several minutes.

But this APM, this layer goes not just into the APM business itself, it's really the underlying structure of our brilliant factory, our health cloud. Everything else that we do actually has an APM component in that. And the first thing that we do about those devices is really make sure that they get connected and we can look at the data in a secure way and we can find out what the operation envelope is, basic notification, basic alerts, performance and so on, so forth. So this is the first level.

The second level is to get some insights from them, to understand how to operate them in the best way, see if there's any emerging problem that will allow us to schedule the maintenance at the right time with the right regime and make sure that we collaborate between the various people that maintain those engines, get the equipment, the personnel, everything else in the same place so we can service this thing in time because we know that the performance for instance is deteriorating.

And last but not least is the optimization of that. And with the maintenance optimization, we can give users not just a specific alert on that, but allow them to change the business completely by giving them better strategy on how to do those things; where to put the maintenance equipment; how to allocate the people and the personnel that is equipped with that and how do you make sure that you can optimize the KPI that you need. If you need to overfire the turbine, we'll tell you how to do it in a secure way, not just tell you that it can be done.

So APM is really -- you see it as a threat throughout everything else that we do, and as Jim talks to you about the Digital Thread, this is going to be a very important part of that.

We cannot finish any talk before we talk about cyber security. And for us, security is super, super important. If you think about that, other people will sell you a million cycles of compute and let's say they will spend 100,000 of them, 10% on security. We will sell you a million cycles of compute and we'll spend about 400,000 of those cycles on security. So you get 600,000, but they are much more secure than the other 900,000 that you get from somebody else.

And the way we approach security is in four dimensions. First, we make sure that the infrastructure, the edge devices, the cloud is secured. We use various technologies -- we can talk about it off-line -- but those things are secured like no other edge device.

The second thing, we want to make sure that our customers, our chief security officer and the various customer organizations, have enough of an IT control over those securities, so they can see who touched the data, what data got activated, what time. Is it normal, is it not normal and we analyze it for them to make sure that if there is any security breach, they get alerted for that.

We are combining, make sure that the fusion of OT and IT is done in a way that will allow you to get stuff nailed and actually any breach of IT security will alert us to what's happening on the OT side. And last but not least, we give them situational awareness, not just what's happening in their field, but what's happening all over the world, what IP addresses are being breached, who are the bad actors that are active and so they can prepare for that.

I would like to leave you with those thoughts. First, Predix is an operating system. We fund it -- we have all the grids we need to deal with the industrial Internet, and I would argue that nobody else has them. It's a combination of our experience and the fact that we're looking at the digital problem in a different way.

We defined the standard ontology for assets. So this is how we can express arbitrary level of complexity and scale for millions -- meter readers for thousands of turbines, etc. We have a standard way to connect machines, so that allows us to build an ecosystem with other partners, hardware and software, that will allow us to create a much more diverse ecosystem of those devices.

And we have a distributed edge computing. It's not enough just to put something in the edge. You have to build it as part of the distributed continuum that goes all the way from the edge to the cloud. And last but not least, the system is super intelligent. The machine learning algorithms that we have actually are not an adaptation of consumer algorithm. Many of them started from the ground up to do exactly what you would like to do, which is minimizing false positive, false negatives and getting things done in an optimal way. So with that, I would like to invite Kate Johnson, our Chief Commercial Officer. Thank you very much.

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**Kate Johnson - General Electric Company - VP, Chief Commercial Officer of GE Digital**

Thanks, Harel. Good morning. My name is Kate Johnson and I've been with GE about three years now. I came most recently from Oracle Corporation and I just want to tell you a little bit about why I came. So the opportunity that we have to define a market and to win in that market is absolutely astonishing. That's what I thought three years ago and now I'm more excited than ever that it's true because we're winning and we're having a good time doing it.





So our commercial approach is just very simple, it's four-pronged. The first thing is we've got to sell large deals. When you're entering into a market and establishing yourself as a leader, it's all about establishing beachheads in our core Industrial Verticals because if you get one, there's always 10 right behind it and that's what we're finding.

The second thing is we've got to build a commercial engine that can handle thousands and thousands of transactions, not the 10, 20 or 30 large transactions, but the hundreds of thousands of transactions because we have individual developers coming and we have the big enterprise deals coming. We need to be able to handle them both and this is all about the Digital Thread in commercial from inquiry to order.

We also need to focus on establishing GE as our best reference and this is actually one of the major strategic advantages that we have as a company. We've been at this for five years now. We're using the Predix platform to drive productivity inside the Company. Jim Fowler is going to talk all about that in a second. But when you go to a customer -- when I go to a customer and I sit with a CIO and I say let me tell you what we're doing with the platform to drive productivity, it's incredibly compelling. And then when I can take them to some of our factories and show them how we're getting that productivity, often times it's game-changing in terms of their ability to believe our story and our credibility in the marketplace.

Finally, strategic partnerships are really the way that we win this and grow at scale. They are the force multiplier. They are how we get acceleration in terms of growth, and I'll talk a little bit about that in just a second.

But how does an industrial company learn how to sell software. It's three ingredients, really. So the first is you have to import digital talent. Selling software, selling digital, there's actually a little bit of a nuance there that's different than just selling products. It's very outcome-selling-focused. You've got to have CIO relationships. You need to understand the software sales lifecycle so you can maximize adoption and customer success so you can drive utilization of your products.

But if we brought in a bunch of digital sellers only, we probably wouldn't win nearly as fast. As a matter of fact, we might not win at all. 90% of the story is the fact that we have 100 years of domain expertise inside the Company. We know industrial pain points. We have service franchises that have been serving customers for a very long time. We have the physics models. We have all of those things combined with the digital selling talent make for a very compelling story and we have outcome selling. We've been very focused in targeting the outcomes that our customers want to see; how do I grow revenue; how do I shrink costs; how do I make it a safer environment, all the things that Bill talked about. And when you put those three things together, we're actually getting traction in the marketplace.

Very compelling market traction actually in the marketplace and what I wanted to talk about, just a couple of themes that I'm seeing when I talk to customers and when I look at our wins. So the first is we've talked about APM, or asset performance management, as the killer app. Lots of companies want to start here. There are a couple of different ways that they can start here.

Early detection. You heard Harel talk about early warning. Think about BP with an offshore oil rig. So if one of those assets breaks and you have to send the right people and the right parts unexpectedly can be extremely expensive, not to mention the fact that unplanned downtime creates tens of millions of dollars of unwanted costs or unexpected costs. But if you can know when those parts are going to fail and send the right people and the right parts during a planned window to avoid disaster, then that's obviously a much better scenario and that's how BP is using asset performance management to drive better performance on their offshore rigs.

RasGas, a little bit different way that they use APM, and you will hear more about this from my friend, Azeez, who is going to talk about it in a couple of seconds. Two LNG trains sitting right next to each other, one performing better than the other, but all the conditions seem to be the same, so what's happening there? Asset performance management capabilities avail what the problems are, we can fix them and drive markedly increased reliability and performance levels. Just different kinds of ways that our customers are using our APM technology.

But not everybody just wants to think about the asset. Sometimes companies say my asset, or my line, or my plant are running actually pretty well. I want to start thinking about things beyond the plant level, beyond the enterprise level. How do I make better decisions? How do I unlock the data in all the silos across all the functions in my company to make great decisions?

Procter & Gamble, a great example of how they are doing that. They've been a manufacturing software customer for a long time for GE, and frankly their lines are optimized. They can produce the most number of diapers on one line that they want to at the lowest cost, lowest scrap, lowest material cost, etc. But should they do 10,000 -- should they produce 10,000 size 5 diapers, or should they do 5,000 size 5 with some preemies? The truth is their demand data is in a different silo and if they could take that data and marry it to what they are producing on the line real-time, they could make optimum decisions to maximize revenue, and that's how they are thinking about using Predix.

Finally, outside of our traditional customer base is the industrials and some of our manufacturing clients. We're finding a whole wave of customers, technology customers, who are coming to us to say can you help us digitize our maintenance. Can you help us provide new services to our customers using Predix. Here are three companies that are Predix customers today, a bathroom fixtures company, a multifunctional printing company with some elevators to boot and a mailing services



company, all of them building apps on Predix, digitizing maintenance and providing new capabilities to their customers. Think about how we're making money off of those customers as well.

Number one, we're charging them to build apps on the platform. The second is when they run those apps in production, they consume services on the platform. That's another way that we monetize. And thirdly, when they sell those capabilities to customers, often times, we share in that revenue as well. So three different ways with helping customers digitize maintenance in many of the ways that we've done in our own franchise, but with completely different business models and different assets.

Alone this story would be really interesting. The reality is it's all about the ecosystem that makes it so exciting. So our partner program is really just incredible. We've already had 30 world-class companies sign with us. They are betting on GE as the horse to ride in the industrial Internet marketplace, companies like Accenture, and Oracle, and WIPRO, and Cognizant, world-class service providers to do the integration for our customers, world-class technology companies to provide us new capabilities, telcos to help us connect, IFVs to build applications on the platform.

These are all the kinds of companies that we need to help build the richest ecosystem possible, and they are coming in droves. We are targeting 50 partnerships this year. I think we will probably hit more like 70, but how do we work with these partners to accelerate business? They bring new capabilities to us. We marry that with our capabilities and we share our customer bases. So we're developing solutions on Predix with them, with our joint capabilities, and we're sharing pipeline.

We're chasing 275 deals together right now off of these 30 partnerships, and they are helping us develop new relationships with CIOs that we didn't have before. Incredibly compelling and just an example, Capgemini, they've trained 200 people to certify as developers on our platform. They are establishing a practice for the industrial Internet that operates off of Predix.

So they are ringfencing a bunch of their people, and in their business model, people are money, and they are dedicating it to our business model. So it's incredible validation of the technology, of our business, of our future together and we're pretty excited about it.

And finally, customer success is the answer to this story. So a lot of customers say to me, Kate, I don't even know where to start. How do I do this? We need to transform the Company, but that sounds like a really big ask. How do I get started? And so we've designed a portfolio of offerings. We can either sell them directly to our customers or through our partners on a force-multiplier basis to do anything from helping develop an IoT strategy with a customer, to do some design thinking about how to drive more value in certain aspects of their operations, to do a rapid start -- hey, let's get started with one asset, let's figure out if we can take the data off that asset and do some modeling and analytics and give you more insight to get better operational performance out of it.

And so really if we think about chasing those outcomes that Jeff and Bill talked about at the beginning, having the right service model, an incredible force multiplier of partnerships to help us go faster, this is an incredibly compelling story. And with that, I will turn it over to Jim Fowler.

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**Jim Fowler - General Electric Company - VP, Chief Information Officer**

Thank you. Good morning. My name is Jim Fowler and I'm the Chief Information Officer for the Company. I've been with GE for 16 years and throughout that time, I've actually had the opportunity to work in every one of our GE business units with the exception of GE Healthcare. And that's been important in my role today because, as Bill explained, the role of CIO, not just in our Company, but in all of the industry, is changing. And it's one that's going from more of a backroom activity of keep the lights on and keep the systems running to one that's really core and crucial to how you drive productivity and really the next generation of productivity through the application of technology.

And so inside the Company, I have responsibility really for taking the technology that you heard Harel talk about and the solutions that you heard Kate talk about and apply them inside General Electric to make GE be the best example of a digital industrial in the world.

Our approach to this we call the Digital Thread, and the Digital Thread really is about exposing our enterprise applications and technology and data, exposing the machines that run our plants and our equipment, exposing the information from the assets that we sell and service to our customers, to the analytics and the digital twin components that Harel talked about to drive productivity in how we run the Company, to actually simplify the way our people work. And this is a big deal for us. We'll deliver \$500 million of productivity in 2015 and \$1 billion between now and 2020 and productivity that will come from this combination of IT and OT, information technology and operations technology.

And our approach to it really has three components. The first is about building horizontal solutions that optimize the value chain. So think about this as exposing our enterprise applications, transactions, data and information in a way that we can apply analytics, artificial intelligence and technology to drive a different behavior that wasn't possible before.



Like many companies, we've done a lot of investment in the last 15 years. We've implemented CRM tools to simplify the way that we sell. We've implemented product lifecycle management tools in the new product introduction process to save time and doing new project introduction in our engineering processes. We've rolled out ERPs across the entire Company to really simplify the way we buy and to drive productivity into our sourcing processes and how we plan for materials across the Company. And from a services perspective, we've deployed many applications to really look at contract management, and how do we really simplify the way that we think about managing the backlog that we have of services work across the Company.

But like every company around the world, what we're left with today are these silos of information that are disconnected, that are optimized for different things. So these horizontal solutions are really only the first step because you could expose that data, but you need to have a way to harmonize it.

And that's where we start to talk about what you heard around asset performance management. We really believe that you've got to optimize for the machines that run your company and the machines that we're selling to our customers. If we can optimize the four vertical process areas or functional areas around the machine, we could drive some new productivity that wasn't possible before.

So Predix is the second component of this and specifically an asset-based model for thinking about how we optimize the value chain of how we operate the Company is the second component.

And then the third component is really around persona-based applications, simplifying the way people work, taking out non-value-added activities that they are doing in their job day to day and automating as much of the work as possible, but then providing one view to how they do their job.

And so it starts to make sense as I give you some examples, so I will share a few. So if you think about the inquiry to order process, we've implemented a persona-based application called Empower in our energy connections business that ties together drawing information that's coming out of our new product introduction process. It ties together information that's coming out of our services business around the assets that our customers have, and a salesperson now can take this application into a customer site and through software that we've written on Predix that's using advanced visualization technology, they can scan an electronic diagram, a blueprint, and that blueprint, through our software, will automatically go find all of the parts that we manufacture in the PLM system that we could apply to that blueprint.

It will look at our understanding of the customers' assets that they already own and it will produce a quote. We actually can produce a quote now and 50% faster than where we were in that business before we started this process, and they actually are seeing \$60 million in increased orders due to the fact that they can quote that quickly off the blueprint.

So here's a place we're able to tie together three different parts of the vertical of the different functions across the Company in a way that we weren't before using technology, really Predix, as the thread that is stitching it altogether. The same goes in the NPI process. In our PLM world, we've done a lot around model-based design, so if you look at what we're doing specifically within our power business today, they are saying we want to stitch that together and connect it to the actual machines and manufacturing.

So they can actually finish a design in PLM and through software that we've written in Predix, we can convert the 3-D model into machine code that can be passed off to the manufacturing floor. They literally can be manufacturing that part in an hour and a half after the completion of the design. The minimum that would have taken in the old world of going through a manufacturing/engineering process was two weeks, so we're taking out a ton of cycle time in the process through this advanced set of analytics and software that are tying the machines and the manufacturing plants to the PLM process that's happening in the engineering side.

These persona-based applications are a big deal though and we talk about them being horizontal. A great example comes in our order to remittance process with our buyers, so we've implemented a persona-based application called SourceCheck. SourceCheck lets every buyer in the Company see every part that we bought from any supplier around the world at any given point in time. They can see min/max, they can see how much volume we're buying from those suppliers, but we're adding to that technology that will actually scan all of the 3-D models of like parts to start to produce a should-cost value that's based on artificial intelligence and the digital twin analytics that Harel talked about.

In the pilot businesses that we've rolled this out to, they are achieving 25% more productivity than they had planned to this year just from the amount of the analytic data that we're putting in front of them on how to actually go negotiate better. But the biggest opportunity for us is really in the services world. As you can see here, \$310 million of the \$500 million in productivity that we're going to generate this year is really coming out of our services space, and I'm going to go a little bit deeper in to help you understand what this really means when we talk about the Digital Thread.

So I said a second ago, the first part is horizontal-based solutions. What does that mean? Well, Harel talked to you about asset performance management. And at the heart of asset performance management is a set of analytics, software and information that are going to be used in every part of the value stream. We're going to use it to push high-quality leads to a salesperson. We're going to be able to use it in the engineering process to be able to show an engineer how a part might be performing



differently than they designed it to. We're going to be able to use it horizontally within the sourcing process to be able to give buyers better information about how to buy or in the manufacturing process to take out work, actual work and lean out processes in our plants.

And in our services world, it's obviously going to be used to be able to drive better performance and availability of the equipment that we're selling our customers. So these horizontal applications are horizontal because they span the value stream, but they also span the Company. I have 40,000 field engineers around the world who come to work in some of the harshest locations you can imagine. They are in deserts. They are out on platforms on oil rigs. And their job is really hard not just in the conditions they work in and the type of work that they do, but in the process that they do it. They have to interact with PLM systems to get drawings. They have to be able to order parts and have them there at specific times. In many cases, they are managing 15,000 different parts at a specific implementation. Being able to manage all of that information is difficult.

So as you can see here, we've built a series of horizontal solutions, APM being the one that we've talked about, but inside the Company, I'm building solutions for Inspection-as-a-Service. How do I use analytics to inspect analytically an aircraft engine or inspect analytically a gas turbine so that I know exactly what workscope that engineer has to do and I can take out the inspection time they would have normally done in their process.

These horizontal solutions will span every business inside the Company and so they are being used through an application that we've jointly developed across the Company called Field Vision. This is the persona-based application layer that I talked about. This is going to drive \$250 million in productivity through all of the work that we're going to take out of the process that we can automate from them. We're going to give them better quality information that's going to improve the quality of the work that they are doing.

Here's the real benefit that goes beyond just this. Those same horizontal solutions that we're developing for contract management, repair and work scoping, I'm going to be able to reapply into other persona-based applications. So Smart Repair will be an application that we'll push into our repair shops and we'll be able to drive the same levels of productivity there with those horizontal solutions that we were within the field services space.

None of this was possible without the Predix platform. There was no way to tie the machine data that's really giving us the insights about how to drive these outcomes inside the Company with the enterprise applications that we've spent so much time and effort implementing over the last 15 years.

And so lastly, I'm just going to give you one example and one plant. I've got 450 plants around the world that I've got to optimize, but just in this one plant in transportation it's Grove City. It's a repair site where we take locomotives for repair. We really didn't have much digitization in this plant, and there's two big components of what we're doing here that I think are just critical.

One is analytics-based maintenance, conditional maintenance. Today, 20% of the parts that are coming in, we have used analytics to determine what type of repair work needs to be done. We will get this up to 70% by the end of 2020 within this plan, so we're actually able to analytically drive the inspection and the work that has to be done in the plant.

The second part of it then is then we can auto-route the part and the actual device through the plant. So today, 20% of the routing and determining what happens in that plant is done analytically, and by the time we're finished within that plant, 60% of the routing will be done automatically. This one plant, this single plant in the Company is going to generate \$25 million of productivity to the bottom line of the transportation business. And I've got 450 more opportunities out there to go after just like this, and so that's where this \$1 billion of productivity that we're talking about inside the Company is going to get generated from the investments that we are making into the Digital Thread.

So with that, I'm going to turn it over to Jen Waldo who is going to talk about what we've done to transform the organization.

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**Jen Waldo - General Electric Company - Senior Human Resources Manager of GE Digital**

Thanks, Jim. So my name is Jennifer Waldo. I'm the Human Resource Leader for GE Digital. Similar to Khozema, I started my career in the Human Resource Leadership Program and worked about 11 years on the industrial side of GE, mostly in GE Aviation. I came out here to San Ramon in 2012 where I really helped with the effort of starting up the Software Center and now have responsibility for GE Digital from an HR perspective.

So I'm here to really talk about our organization and our talent strategy. As Bill spoke to you about this morning, we created GE Digital in September of 2015, and at that time, we brought together multiple organizations across the Company to really pull together all the digital employees. And we now have 28,000 folks across the Company that are really focused on digital work.



The majority of them are in product management or engineering and about 32% of that 28,000 resides in our IT function. Since that 2012 timeframe, we've brought in about 5,500 people that we've hired externally from the tech industry, and we'll hire another 2,000 by the end of the year.

So even with all that hiring, which is with talent that is used to moving around a lot, our attrition tracks around 5.5% versus the technology industry, which averages around 22%. So that's a number we're pretty proud of and there's a couple of reasons why we think that we're there.

The first is employees and candidates find the vision for the industrial Internet extremely compelling, as you've heard from many of my colleagues today. The second thing is we're working on cutting edge technology, and if you work in this space, that's really what it's all about at the end of the day. The third reason is you can work at GE and work in multiple industries. So to be truthful, you don't have to really bounce around because if you're tired of working in one business, you get an opportunity in the other.

So when we started this whole effort, there was no GE Digital and there was no Predix, and so as we reached out to candidates in that 2012, 2013 timeframe, 90% of them didn't even know GE built any form of software. So we had to get much smarter about our brand and much more sophisticated about our recruiting practices.

In those early days, we were focused mostly on proof of concept and this was in our services productivity area. And then we grew to focus more on applications and then today platform and cloud. And as we have matured that strategy and evolved it, so has our talent strategy and the sources that we have focused on as we try to build out this digital industrial.

As you can see, this would be a typical profile that we're looking for today in a developer. This is full stack experience, employees that have had an opportunity to work on platforms and build applications, both front-end and back-end development and then opportunities to also work in a DevOps type environment.

You can see contemporary languages with education being what you would typically find of any technology industry profile, computer science, electrical engineering from some of the best schools in this space. We are going to hit campus really hard this fall, and so hiring folks right out of college is a big part of our talent strategy as we move forward.

So look, as we have made this pivot and we've tried to really focus on digital, we've really had to transform the way that we think about talent and most notably in the areas of both recruitment and compensation. From a recruitment perspective, when I first arrived out here, we were 100% outsourced, recruiters that didn't know much about the space and it was run on the East Coast. And if you are not from the West Coast, you'll understand that there's a big distinction when you are talking about the tech space.

So the first thing we did was insource the function, hire recruiters that have expertise in domain and the technology industry, and run the operations out of here. When I also arrived here, GE had wonderful brands in our industrial markets, and so we have great candidates apply for our jobs in those spaces. We don't necessarily have that advantage here. So our strategy is 100% focused on passive candidates and these are folks that are very happily employed where they are at today in other technology companies.

And we've really had to work on the brand. If you've seen our recent ads, the software developer who we affectionately refer to as Owen, that accurately reflects the experience that we've had as we've recruited over the last couple of years, which is part of the reason why I think the ads have done as well. And they've really helped us as we've created GE Digital to really be able to attract talent from some of the premier technology firms that we're all very familiar with.

The other area is compensation. Again, when we first started this effort, we were benchmarking compensation against the industrial sectors and very quickly realized that that wasn't going to be very effective in being able to attract and retain talent. So now about 28,000 digital employees are benchmarked against the technology industry, and we've made adjustments to the model.

So below executive level historically at GE in the industrial space, it's really just a focus on base salary, and we've had to really widen the way we look at that to have base plus bonus, plus equity, which is usually in the form of RSUs. So we've also had to transform the way we think about learning and career development. It's far less about the classroom. It's about focusing on technical skills and capability and less on leadership and managerial that have been such a hallmark of GE's reputation.

It's less about climbing a band-type structure and it's more about growing your career and your skills and your capabilities that's far more and sort of a circular way than necessarily a ladder. And probably most important of anything of all is the culture and the community. So when we started this effort, we didn't even know who built software in the Company. It was that basic.

And so by creating GE Digital, we've been able to put digital employees with digital employees, which is important for culture, it's important for community. We run our own developer conference annually, which is very similar to what you would find in most tech companies, which helps us with engagement and creating the right culture.



And then you look at it, we have an industrial culture that is very well-known, but we've got to also start to infuse the digital, which we're well on our way of doing. And so when you look at tech, tech is just different. Having lived on both sides, I know the distinction. It's faster. It's more agile. It's more risk-tolerant. But the truth is we're never going to purely be a tech company or purely an industrial company. Really what we're doing here is fusing the two together, which gives us a really unique value proposition for candidates and for our employees. And this culture is probably the biggest part of this transformation for us. So with that, I would like to introduce the Chief Digital Officer for Power, Ganesh Bell.

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**Ganesh Bell - General Electric Company - Chief Digital Officer of GE Power**

Good morning, everyone. Good to see some familiar faces. I've worked in the software industry all my career in Silicon Valley and I started as a developer and I've gone on to be an entrepreneur and run technology and analytics platforms in some of the biggest software companies in the world. I came to GE with a simple belief that every industry, every business in the world will be reimaged with software. And Bill talked about our industry being asset-centric.

In electricity and power -- just imagine this -- more than one-third of the world's electricity comes from a GE machine. That's the installed base that we have, and the world needs more power, 50% more power over the next two decades. And you can see the position being reflected in my digital business here.

So in 2015, we did about \$2.4 billion in orders and we're going to grow that over 30% in 2016 to over \$3.1 billion of TCUE, and our opportunity is big because this is not just about software for the industry because our industry is being reimaged, reinvented and transformed using software. And that's the thing I want you to take away with, which is every industry that GE is in is being reimaged, and only we can help our customers go through that journey because we think we have an opportunity to create a category-defining portfolio. Just like SAP defines ERP, or Salesforce defines the category of CRM, we think we can define the categories that are going to emerge in every one of these industries all the way from the edge of the cloud.

And there's a lot of proof of that. I said our business is growing at 30%, but our new business of the new portfolio of Predix-based applications is actually growing at 80%. Just in the last six months when we launched our suite of applications that we call the digital power plant, or simply put what happens when you combine Predix, APM and a suite of applications to take a power plant or a wind farm digital. It transformed that business. We've had over 20 customers that have signed up since then.

So we believe that this opportunity is really about leading the digital transformation and helping our customers go through that journey and create new business models, not just for us, but also our customers.

So what does digital mean from the industry lens, from our customers' lens. The World Economic Forum did a study last year across many different industries on what happens when digital enters industry, or when industries go through digital transformation. Yes, there's productivity. Yes, there's business model transformation, but there's also disruption. People care about outcomes; outcomes like in the electricity industry it's like 75% of the breakdowns can be eliminated. 8% of the world's electricity that gets generated never reaches the consumer. Think about that. Optimizing that is huge value. Integrating renewables is a big challenge. You are clearly here thinking about new business models.

Just applying digital technologies, there's over \$1.3 trillion of value to be created over the next decade that our customers have access to, \$1.3 trillion just by applying digital. And there's big societal benefits from this in terms of decarbonization and creating new jobs like \$2 trillion of value. And just by deploying APM, they found out that it's going to be over \$387 billion of value for our customers over the next 10 years.

So why now? So if you think about it, if you're in the power industry, if you are a power producer, a utility, a grid operator, or an energy service provider, your world is changing. Here in California by 2030, we have to generate 50% of electricity from renewables. In Europe, there is an overabundance of capacity. In Asia, in China and India, 70% of the energy that's going into the ground is coal. That needs to be decarbonized on COP21.

And a system that we design where electrons flow from generation to a consumer is being challenged as consumers of electricity are becoming producers of electricity. That means the grid has to become two-way. And utilities across the world have to think about a business model way beyond selling electrons. Go behind the meter, sell new smart services.

So all of this means they have to transform their business and the biggest lever they can pull is digitalization, creating new value from digital assets. And there's a lot of proof of that. And if you've been following any industry, you know that when customers start to scratch their own itch, that's when new markets and new categories are born.





Just the top 20 of our customers have actually invested more than \$0.5 billion in software companies. Think about that. Electricity companies, which don't know anything about software, are investing in software companies. That is proof that categories are going to be born. And it doesn't matter if you believe the productivity story, or the transformation story, or the disruption story, digital is becoming an agenda for every Board member and CXO across industries in the world.

And even our own customers are actually installing chief digital officers to create new digital businesses. So what is our market opportunity? Bill talked about \$225 billion in the industrial Internet. More than one-third of that sits in what we call the electricity value chain, which is now becoming a network because when digital enters industries, linear models become network models. And customers are talking to us about problems that they want to solve in some of the categories like asset performance management, or optimizing their business, or running their operations, or looking at grid and my colleague, Maryrose, will talk about how they are even thinking about energy efficiency and how they want to participate in that.

But there are whole new categories that are emerging. Just like Jim is thinking about how we work internally efficiently as digital workers, our customers are thinking about how every one of their workers is becoming a digital worker all the way from generation to being in the field, to look at grids and do field service. And at the end of the day, this is really about when you think about Uber of taxi, it's a logistics platform. It's about managing supply and demand. So we believe in energy there's going to be platforms that manage supply, platforms that manage demand, and those are going to be built on top of industrial Internet platforms.

So when customers talk to us, they want to buy simple solutions and we will organize their portfolio into six product lines based on the buying center and the outcomes that Jeff talked about. If you talk to a CIO, she cares about having enterprise visibility across all of the data. It doesn't matter if it's a GE machine or a non-GE machine. It doesn't matter if it's an IT system or an operation technology system. She cares about having complete visibility of all that data and having built applications on the same platform.

Just like Facebook maps the socio-graph, or LinkedIn maps the professional network, our platform, Predix, maps the asset graph, the entire landscape of a power plant or wind farm or a complete grid. These are some of the most sophisticated machines we have built in our history. And that's what the CIO cares about. A chief security officer cares about not just the IT security, but protecting the machines, so we have great cyber security solutions for that to protect all of the assets for them.

And when you think about an asset manager or a plant manager, they care about increasing output out of the machine, reducing unplanned downtime. That's why they buy asset performance management solutions. A head of operations or a generation cares about productivity. When you connect all of those machines to their core business processes of running their business, which is operating a power plant, doing outage management, they care about operations optimizations.

A C-suite cares about profitability, meaning taking advantage of market fluctuation, energy pricing, or opportunity to produce their power plant, run it faster, run it slower and that's really about business optimization. So just like enterprise software companies has a suite of software like a finance CFO has ERP and a head of sales has CRM, asset managers, plant manager, heads of operations, C-suites now have applications to actually run their core business.

And a key part of this portfolio is what you see in the middle of the bottom, the edge and the advanced controls. Several years ago, we started this journey of understanding that there is a lot of data close to the machine, and Jeff talked about doing real-time microsecond decisions around that machine. This is deep science, high-performance, analytics, machine learning applications. And our customers wanted to push our machines through a higher performance threshold, and we saw an opportunity to actually drive that through analytics.

And at that time, we created an application that we call FlexEfficiency, and we sold it as part of some retrofit of hardware and we ended up calling it AGPs, probably not brilliant at that time. Now we know that that has given us a whole new advantage and a headstart because that was the first foray for many of our customers to use software and analytics to push their machines and run more out of their asset, get more out of their assets.

That has evolved to a whole new portfolio for us in terms of having a platform that have edge applications like virtual battery, that make a giant baseload power plant behave like a virtual battery. That means they can eliminate CapEx for a grid operator to have a baseload power plant and not have big energy storage at the grid so they can make up for the fluctuations in renewables.

And we'll have more suite of applications around this edge, and this is also the birth of our digital twin because we started modeling the machines very close to where the data is. And when you connect it to the cloud, you have a cloud-aware system all the way from the edge. So when we think about this portfolio, we're really excited that we have a category-defining portfolio, but the most exciting part is what Kate talked about, which is the ecosystem. This is already forming.

And I want to show you an example of how this is working in the utility industry. We don't make all the hardware that goes into a power plant or a wind farm. For example, Woodward, who is at the top there, they make valves, pumps and actuators. Because we have the platform, Predix and the idea for digital twin, they are modeling their valves, and pumps, and digital twin and putting their analytics as part of our APM solution. Now our plant manager has a complete visibility of all the assets.



Or we can look at companies like NeuCo, which actually built the machine learning, neural net artificial intelligence software, about 10,000 sensors across a coal-fired power plant to optimize boilers. Now, obviously, that's part of our acquisition portfolio, but it generates huge value for our customers. And also partners like PwC and Capgemini are lining up to actually build applications and implement the digital transformation journey for our customers.

And this is a slide I'm really excited about that I probably could never do in my past career being in software companies. I only had an option of selling a license or a subscription or software. Yes, I can do that. All of my customers are buying Predix, or APM, or operations optimization in a traditional SaaS model like a subscription to that solution, but every opportunity that I have with a customer to interact, which happens a lot today because of our multiyear agreements and contractual service agreements, I can actually introduce them to software.

A favorite example of mine is A2A, who is a multi-utility Italian company. They shut down a power plant two years ago, and as part of our engagement and our relationship that we have, we were able to show them through software we can actually make that plant profitable and competitive in the ancillary market in Italy.

In the last five months, they've reopened the plant, they've deployed APM, they've deployed our platform. Now it's actually competitive. So you see that this is actually expanding our total addressable market and is actually accretive to our services business.

And lastly, because we understand the value of these machines and also understand the operations and truly understand the economic value of every one of these outcomes, whether it's fuel efficiency, or heat rate, or unplanned downtime, we can model that economically and have a gain share model with our customers and bill it as a subscription.

We call that Outcome-as-a-Service. That's a new business model for us. Every one of these is a recurring revenue model that adds to us in terms of having a marketshare that is beyond just our machines across the entire enterprise and improve our wallet share with our customers.

Just to show you how this is happening in the rest of the world, I want to invite my colleague Azeez Mohammed to talk about how we're doing this in the Middle East.

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**Azeez Mohammed - General Electric Company - VP, Services Middle East & Africa of GE Power**

So hi, guys. My name is Azeez Mohammed and I lead Power Services for Middle East and Africa. I've been with the Company for 18 years, and I've done stints starting with R&D, then went into finance, corporate audit staff, BD, and now business management.

But before all of that, in grad school I was applying artificial intelligence to business and engineering processes. And back in the day, I never imagined that a day like today would come, where we are actually talking about these technologies and we are actually applying it to the real world. So it's really exciting to be here.

My goal today is to give you a real frontline feel of the customers that are embracing these technologies and what kind of value they are deriving. Okay? To illustrate this, I want to pick one of the biggest growth regions in the Company, Middle East and Africa, and I want to talk about GE Power there. Okay?

So if you look at Middle East and Africa and if you look at GE Power, we are very active in 30 countries, with untapped potential in 30 more. When we segment the market out here, the countries fall into two distinct groups.

The first group of countries are ones that have a very high installed base, like Saudi Arabia, South Africa, and so on. These customers care about taking their productivity to a whole new level. They want better fuel savings, they want more reliable equipment, squeeze more output.

On the other hand, there is another group of countries where the supply and the demand, the gap between them is so large. Here we have a unique chance to do it right the first time. So here is where you work on software-defined products and so on.

But for all these customers, there is something very unique that is happening to our region. As you know, the economic situation has taken a turn for the worse because of dropping oil prices, which means that the need of the hour, to move from CapEx, heavy upfront CapEx investments to more of an OpEx outlay, has become very critical. We are able to do this with the GE balance sheet, and this is particularly attractive for the customers.

Now I just want to give you three case studies, three examples of deals that we have signed recently, which are at different stages of execution. By taking you through these I just want to answer a few questions.

The first one is: Who are the customers that are buying these? What exactly are they buying? What is the value that they are getting out of it? And finally, what does it mean in terms of growth for GE?



The first example is RasGas, which is the first worldwide application of our killer app APM. Now, RasGas is a government-owned LNG producer; they contribute 45% of the GDP of Qatar.

What they really do is they take gas from offshore. They put it into a giant refrigerator, which uses a lot of power. They convert it into liquid, and they put it on ships and sell it to the customers.

Now as you can imagine, the scale of these operations are quite big. This entire process that I explained to you is called a train, and you see a picture there. It's about a mile long.

When you look at the number of assets there are 1,000 assets. Of these 1,000 assets, only 100 are GE assets. The remaining 900 assets are assets that we never looked at in the past, and because of the digital capability we are able to do this.

Now, looking at customer pain points, there are two. The first one is if the train goes down for a day the customer loses \$150 million. The second pain point is if they are not able to convert the gas into liquid fast enough, they are going to flare the gas, and that's another loss.

Now technically, how do you solve this problem? When you look at 1,000 assets and all the data coming from it, it's humanly impossible to manage the puts and takes.

So we've connected all of these assets into our Predix platform. The data is streaming, and it's coming out there.

We are comparing similar assets within the plant and across, and we are able to create alerts proactively or early-warning systems which can tell you if an asset is going to break and when it could break, so that you can bring them down in a planned manner. Likewise, when you put these assets together using the data, you are able to build a full process optimization and you are able to reduce the flaring.

If you look at the contract itself, it has got four parts to it. We get paid in four different ways.

The first one is a deployment fee where we use solution architects and professional services to actually deploy a solution. It's a one-time fee.

The second one is a recurring annual revenue over a period of 25 years. The third one is performance bonuses if you are able to achieve the outcomes that they want.

And the fourth one, which is most exciting for me, is upsell opportunity for more apps. So once you have the platform and as the customer is getting used to this, they are going to build more and more on top of this, and there's going to be more growth for our partners and products.

Now when you look at scalability of these applications, this falls into the category of what I call a power-intensive application. If you look at my region alone, the other power-intensive applications include things like industries like aluminum smelters, cement factories, not to mention the various LNG facilities across the world. So the same solution can be applied and customized to all of these industries quite easily.

The second example is more close to our domain, which is Power Generation. Our customer is Saudi Electric. This is a recent win that we had actually; we competed against Siemens and won this deal.

Now when you look at the complexity of the assets, you have 16 power plants, 500 assets strewn all across the country. And when you look at the composition of the assets, the vast majority are GE turbines, but about 80 of them are Siemens.

If you look at what the customer wants to get done because of this, they worry about taking this to a whole new level of productivity. So they worry about dispatching; they worry about alerts before a plant can fail; and so on.

These are very complex because of the diverse set of assets and different manufacturers and so on. I want to take one example to illustrate why this is complicated.

Take the example of dispatch. The way the dispatching happens today is a customer looks at the fuel pricing of the day; they look at which are the efficient machines out there; they match these two together; and they say: These are the units that need to be dispatched today and the others are going to stay idle.

Now if you look at just the data of this, some of the data of the efficiency of these assets are as old as the day the plant was built. How things are changing so quickly day to day and within the day, with the environmental conditions and so on, you need to have real-time data.



I mean even if it is like 10 minutes old, you need a real-time data for this. That is what we attempt to do using APM and BO and OO.

If you look at the right-hand side of this, the customer has defined these six use cases, and this is what they want to start with. But I'll guarantee you that as time goes by there will be 100 use cases that the customer wants to do to keep improving their operations, so there is always upside to this platform.

Now if you look at SEC as one customer and how this expands to other customers, there are at least 30 other asset managers just in the Middle East and Africa region, okay? So this is where the growth is going to come from.

The last example is, again, a recent win. We won this couple of weeks ago. This is a power plant in Pakistan; it's called Hubco. It's a 1.3-gigawatt plant.

The beauty about this is there is no GE equipment in this plant. It is all Ansaldo steam turbines.

Even a year ago, I would be afraid to even touch this plant and to work with it, because I need to know how to go work this. But digital gives a whole new capability, and I'll explain how.

You heard the concept of digital twin being talked about a lot. We've been building digital twins of all kinds of assets -- turbines, pumps, heat exchangers, and so on -- at least for, I can remember five years; maybe it's more than that. We have this library that exists that is going to be used in our Predix environment.

So we can take a plant like this and we can customize it and build out a digital twin of this plant anywhere from one to three months. I don't think a lot of people have this capability. And from this standpoint, I would say we are at least five years ahead.

If you look at the customer outcome, they care a lot about efficiency, even though the fuel prices are low. If you look at on the right-hand side how it's going to come about, you look at it, there are three software elements to it: APM, NeuCo, and OO; and these are going to give 3.5% of efficiency.

You see a very small portion there which is hardware and services, which actually is dictated by the software, which is quite interesting. So the mix is very lopsided towards software, and because of this we are able to even play into other OEM plants.

Now, this 1-gigawatt plant is one out of the 300 gigawatts in my region. So you can do the math on scalability of all this.

Then I want to wrap my segment by just pointing out three things, okay? The first one is the collective value of these three deals are \$300 million, okay?

And the scalability happens in two different ways. The first one is within a customer, where they come up with new use cases and we build on top of it; and it is also taking the same solutions and scaling it across various other customers.

The second point that I want to make is, if you look at the revenue that it is driving, none of this \$300 million revenue existed a year ago. This is entirely accretive to my business, so this is very attractive to me.

The last one as, the customers, the market leaders are also the early adopters. One would say: Why would a company like RasGas, which is the best run company in this space, try to drive these things? Because they feel the need for this. They need to do different things, come up with new business models.

Like for example in Hubco we have come up with this outcome. So they pay nothing and we -- they pay as they get the gain. So we're coming up with very creative new things, even -- I mean, these are the market leaders that are driving this.

So this is very exciting times here. And with this I would like to hand over to Charles who can talk about the Healthcare story to you. Thank you.

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**Charles Koontz - General Electric Company - Chief Digital Officer of GE Healthcare**

Thank you very much. Well, good morning. The slide says less than a year; it's actually less than five months, but I'm glad to be here. My background -- I was a partner at Ernst & Young, I was a partner at Booz Allen Hamilton, and also an Executive Vice President at CSC. So I come at this from a systems integration and consulting perspective.



But why I joined GE -- very comfortable with where I was. When you think about the asset base, the installed base of GE worldwide, you think about the digital agenda, no company is better placed, no company is better positioned to move the healthcare industry into their digital future. It's amazing, and we have the investment capacity to do so.

So let me start a little bit with our business. It's big, \$2 billion in the Healthcare digital business; but if you've been following it for a while, it's been flat.

I've been asked to make that different. I've been asked to grow the business.

We have some great assets at our feet. We've got a deep installed base and great customer relationships.

Jeff and I were at a customer in San Francisco yesterday: 20-year relationship. Fabulous. They want GE.

And I could tell you a number of stores around the country about how deep our relationships are. We are the world leader in radiology imaging -- across the world, number one. We also are gaining market share in enterprise imaging; that includes the ultrasound devices.

But what's maybe not always known is that we also help hospitals run their financial operations. KLAS, that rates software companies, rates GE number one in financial management. So we have some great assets we're going to take advantage of.

We do have to look at our portfolio. We do have multiple platforms. We're in the process of rationalizing those, and we are going to move them to the cloud, because we're talking about shifting to software-as-a-service.

Let me talk a little bit about the marketplace. You guys have been around and studied healthcare. There is a shift, a huge shift, to pay-for-performance. It is causing our clients and customers great anxiety where their business models are changing.

Care delivery is no longer in the hospital. It is moving to the home; it is moving to the primary care physicians and also clinics.

All of our clients and customers are talking about the cloud. If you work in the industry or talking to a CIO, three years ago they were very concerned about the cloud because of HIPAA regulations. Now, with data exploding due to regulations, due to pay-for-performance, due to making sure that the claims data is appropriate to make sure they get paid, their datacenters are bursting at the seams. So now they can't move to the cloud fast enough.

Related to that, and very interestingly, our providers are looking at how to monetize their data to create new revenue streams. They're looking at how to take that data and also with a base of improving clinical outcomes.

And they're asking GE to the party. They're asking GE for our expertise and our help.

So we've got a great marketplace. How are we going to take advantage of that?

Well, first of all, we're going to own the digital layer that sits on top of our equipment, but also on top of our competitors' equipment. We're going to connect people, systems, and devices through Predix in the health cloud and take that data and analyze it.

So we're investing heavily in that layer. We will own it, and I'll show you some examples.

We're standing up the Health Cloud. We've talked about Predix in the cloud; the Health Cloud is slightly different because of the types of data we manage. So it has to be secure; there are privacy issues.

But when you think about the data that we're managing -- sure, we're managing the machine data that comes off of our devices in the healthcare environment. But we're talking about clinical data, we're talking about operational data, and we're talking about imaging data. So it's a very complicated set of data.

We need to build -- and I guess one of the reasons why I'm here and excited about here -- we have to build a solutions organization. Yes, clients want to buy a device; customers want to buy a device; they want to buy software; and they want to buy the cloud.

But what they really want is -- how does it all fit? How do we develop applications in radiology and cardiology, oncology that really drive outcomes?



So we have to have a solutions mindset going into this market. And we will do that not just as GE but, as all of my colleagues have said, we'll do it with ecosystem partners.

Lastly, applications. We are definitely going to build the applications to help our clients. We are in discussions with no less than 15 top-tier providers in the US and across -- and in Europe -- about what applications need to be built, leveraging data that's created by GE.

Why now? What's going on? There's big shifts in the industry.

We're talking about, as I said, fee-for-service, pay-for-service, now to pay-for-performance. We're talking about -- where we focused on EHR before, we're now talking about focusing on outcomes.

We're talking about the patient/doctor relationship now shifting to a collaborative care model, collaborative care delivery. And it's a huge shift. We're also talking about, again, hospital not being the center of the universe, but clinics and other alternatives as part of that.

At the base of this all, and the shifts and making sure they follow the regulation, analytics is key, absolutely critical to making this happen. And we will develop the analytic capabilities. We have it today; we will build it organically; and we will also acquire companies as necessary.

We have a portfolio. The good news is we have a rich portfolio of applications. You can see them there across -- what broad spectrum of imaging, care delivery workflows, cellular diagnosis.

So we are in this space and we are world leaders. What are we going to do different?

Sure, we're going to develop these platforms further; but we're going to build the ecosystem partners, and we're going to build new apps. We're going to move these applications to the cloud. We're shifting the model to software-as-a-service.

What else is different than a few years back? It's what we're all building with the Predix in the cloud and what Harel talked about. We're talking about the connective tissue that again brings together people, systems, and devices, and that's going to be critical as we look at the hospital operations.

So I'm excited about the future, very excited.

How are we going to win? How are we going to beat the IBMs? Sure, we'll partner with them; but how are we going to beat the Cerners and the Epics of the world?

We've got world-class technology. We've got the best technology not only in the world, but around the world.

Look at the data. We have 1 million devices collecting data every day; 16,000 scans a minute going into our repositories. They will be going into the cloud.

You see 124,000 machines under active management. That will only continue to grow with Predix and APM.

The other thing that is to take in and breathe in -- blow your mind maybe a little bit -- is 69 billion images under management. I'll let Harel tell you what that means as far as data size, exacta-bytes, but we are going to lever that data. Our clients and customers are asking us to lever that data.

73 million medical records and \$220 billion in financial transactions. GE, GE Healthcare has clinical, imaging, and operational data, so we are very well positioned to move forward.

How we win, deep clinical domain; we're going to connect the clinical, financial, and operational data to generate insights for our customers, to improve their outcomes. We have a wing-to-wing view of the imaging value chain based upon our devices, and it can only improve with Predix and the Health Cloud.

We have a continuous pipeline of new data coming in, coming off their devices. So Predix will be critical. So we will and are becoming the partner of choice to move our provider clients into the digital future.

Let me give you two examples. The fact of the matter is, this is not the future. What I just described is not the future. It is now. We're selling it now.

Here's an example of a customer in the UK: very large hospital, 6 million patients, 2.5 million exams a year. It's a radiology consortium; 50,000 clinicians. Seven trusts -- think of trusts as large hospital groups. Seven different data systems, seven different datacenters.





They came to us because they had a huge problem. Fact of the matter is they're constrained in their radiology resources and they had to outsource a lot of the screenings, a lot of the analysis of the images. The issue was they were paying GBP60 a view, and NHS was only refunding GBP20. Huge deficit, huge problem, particularly when you add 2.5 million exams per year.

So they came to us, and we are looking at -- are in the process of this right now -- implementing the Health Cloud. What we have here is advanced visualization with collaboration tools.

What they are asking us to do and we're in the middle of implementing, and it's going quite well, is take the seven systems, put it into the cloud; allow the 50,000 clinicians across the seven to access that data and analyze it, thereby better optimizing the use of the critical resources, reducing costs by two-thirds, and increasing throughput by 50%.

Now we have four of the trusts going live. We have a fifth going live next week. Then by the second half of 2016 we'll be live with the full set of visualization and collaboration tools. So we are selling the digital view in healthcare today.

One other one I'll leave you with. We talked about asset performance management. Healthcare certainly is trying to optimize the machine data, but what we're really talking about is to -- how do we best utilize the equipment to improve throughput?

Houston Methodist, a very large chain of hospitals in the Texas area. Fact of the matter is we implemented APM here a while ago; and for us it's the machine data, it's the analytics, and it's professional services.

Very successful program. We have a savings of 10% to 30% on MR exams, and the variation is due to the type of exam. 3,250 additional cases a year, generating another \$4 million for the hospital.

What we then did is took this solution and then commercialized it across the IB. So what you will see out of Healthcare in the future is pilot with one, and then scale at speed. That's what we'll do with all of our applications.

So at the end of the day, what I want to leave you with is GE has the asset base; we have the technology; we have the data and the analytics; and we have the investment power to make this digital vision a reality. So I thank you.

With that I'll turn it over to Seth, who will talk about Transportation.

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**Seth Bodnar - General Electric Company - Chief Digital Officer of GE Transportation**

Thanks, Charles. All right, thanks. I'm Seth Bodnar. I am the Chief Digital Officer for our Transportation business.

It's a pleasure to be here with you this morning. Azeez talked about LNG trains a few minutes ago. I'm going to talk about a little different type of train.

Look, I think you've heard from our colleagues this morning that digital is not just a vision, it's a reality. And that's absolutely the case for us in the rail industry, so I want to spend a few minutes talking about what we're doing in GE Transportation and how we're working with our customers to deliver real and meaningful outcomes for them today.

I think it will provide some helpful insight into how the digital strategy that Jeff and Bill and others have talked about is being implemented in a big, heavy industry that's vital to our global economy. I want to do three things: I want to talk a little bit about the environment and how we see it; and I want to go a little bit deeper into our business and give you some tangible, specific examples with the outcomes we're driving with our customers; and then finally talk about the key role that Predix plays in this.

For those of you that follow the rail industry, you know our customers face a tough environment. Volumes are down; we're seeing a structural shift away from coal.

There is opportunity on carload and intermodal, especially as our customers continue to improve service quality and reliability. But overall it's a tough environment.

If you look at this page, though, you see we're growing orders at a nice clip in the digital part of our business. We're doing that fundamentally by helping our customers better integrate and utilize data across an incredibly complex and dispersed operation that is a railroad.



We do that in multiple ways. We do that by enabling our customers' locomotives, GE or other OEMs, to really operate as mobile datacenters that are gathering and assessing information in real time, not just about the locomotive itself but about other assets -- helping railroads make better decisions.

We're doing that by leveraging Predix to develop a cohesive, integrated suite of solutions that gives visibility to a railroad's entire operation, again helping them make better decisions. And we're doing that also by delivering software that helps our customers better integrate with their customers, rail shippers, during that critical first and last mile of a shipment.

Ultimately, we are successful when we deliver outcomes for our customers. We're doing that, and we think there is an enormous opportunity for us to continue to do that in the future.

To understand that opportunity, I think you've really got to understand the rail landscape. This is a very simplified picture of the path that a container travels from shipper to receiver. The first thing that should jump out at you at this page: millions of assets involved; multiple interchanges, handoffs, interchange points.

Many places where things can go wrong. And as you'd expect, many things do go wrong.

In fact our customers everyday experience thousands of hours of train delays due to asset failures, suboptimal network performance. Those delays impact in a major way our customers' operations.

An important point to note: you see the locomotive there in the graphic. Locomotives are an important part of this, and we are absolutely in our locomotive business leveraging digital capabilities to continue to build the world's best locomotives and optimize how they perform in service.

But we already have and we're continuing to expand our aperture to look at other assets, to look at that complete operation, to leverage data and analytics capabilities, to leverage the Predix platform, to give visibility to our customers' entire operations. That's how you drive out the system inefficiencies.

And when you do that, you not only can save billions in costs, you can also improve service quality and service reliability. That's what enables our customers to take share from other modes of transport and grow their top line. Those are the outcomes that matter to our customers.

The good news is that small, incremental changes can have a really big impact. Take fuel: just a 1% improvement in fuel burn can drive over \$100 million of savings for our customers. And small improvements in asset utilization, things like railcars, drive billions of opportunity.

The framework that we've developed for helping our customers realize these opportunities is what we call the Rail Operating System, or the ROS. The ROS is fundamentally about four things: it's about helping our customers get the most out of their assets, locomotive and otherwise; it's about increasing velocity of their networks; it's about optimizing how they run their operations; and it's about enabling them to better integrate with their customers.

Much like a consumer company might provide a suite of applications for an individual, whether it's maps, calendar, mail, to help optimize how you live your life, really the ROS is that for a railroad. It is a cohesive, integrated suite of solutions that helps optimize the entire operation that is a railroad.

We're really excited about it. We've got work to do to fully realize this vision, but we're off to a terrific start here, and it all starts with the train. At the end of the day, a railroad's job is to deliver a train to its destination on time, and we have an entire business focused on helping them do that more efficiently and more reliably.

At the heart of the train performance business is our GoLINC platform. Harel talked about edge devices. The GoLINC is a great example of a Predix edge device.

It's a networking, processing, storage device that basically turns a locomotive into a mobile datacenter. We like to think of it sort of like putting an iPhone in the pocket of a locomotive. It's the platform upon which you run applications.

This platform is already serving as really the brain of the train on more than 6,000 locomotives running out in service today. Again, this is GE locomotives and other OEMs.

This enables terrific applications, GE or third party, to optimize how trains perform. Let me tell you about a great example, an application that delivers real outcomes.

Trip Optimizer listed here. Trip Optimizer is a smart, automated cruise-control system for a train. It ingests data about the route that the train will be traveling over, what the train is pulling, and then it automatically drives that train in the most fuel-efficient manner, saving on average 10% of fuel.



Trip Optimizer is installed at every Class I in North America as well as multiple international customers. Our customers have operated the system in auto-control mode for more than 125 million miles. In the process, they've saved over 100 gallons of fuel. That's an outcome that matters for our customers.

Another great example is our LocoVISION platform. LocoVISION is a high-definition camera system. It has inward-facing to the cab, outward-facing to the rail and wayside equipment. It obviously provides an ability to analyze and assess data after the fact.

But when we reach into the GE Store and we work with our GE GRC counterparts who are developing cutting-edge video analytics capabilities, and you pair that with the processing power of the GoLINC, you're able to do video analytics in real-time: to look at and understand problems with the track, problems with the wayside infrastructure, issues with the crew.

And you're able to act on those things in real-time and prevent mission failures, increasing rates of train mission success, reducing delays. Again, that's a big outcome that matters to our customers, and we're doing it today.

But a train is just a part of a broader system. An efficient train, it doesn't matter if it sits in a congested network. So we've developed a great suite of solutions to help our customers optimize their networks and better run their operations.

A great example here is our Movement Planner product. You can think of Movement Planner basically like an air traffic control system for a rail network. It optimizes the meet/pass decisions of trains around that network, ultimately enabling more trains to run at higher velocities on that same network.

Movement Planner is already installed at one North American Class I. We're in the process of our second. By the end of next year, we will have about half of all freight rail traffic in the United States managed with this system.

It can increase velocity up to 10%, decrease expired crews by about 50%. Outcomes that matter an enormous amount to our customers.

But the main line is only part of the problem. You've got to think about nodes. A great example of one of our solutions here is our Smart Intermodal Terminal solution. Intermodal is a key source of growth for our customer; you want to optimize the throughput through those terminals where containers are transferred from truck to rail.

Smart Intermodal Terminal is our next-gen terminal operating system. It's architected on Predix. Ultimately, it's going to run over 100 terminals and handle more than 300 million containers every year, enabling a key source of top-line growth for our customers. Big outcomes.

As I said at the outset, though, rail is an old industry, but it's an incredibly complex and incredibly technical industry. An issue in one part of a rail network causes ripples that propagate throughout the entire network, and those issues can persist for days, even weeks sometimes.

So if you really want to drive system and efficiency, if you really want to achieve the outcomes that our customers need to, especially in a tough environment, you've got to have visibility to the whole system. And that's where Predix comes in. We're building our solutions on Predix, and Predix is the connective tissue that gives that full visibility to the entire operation.

So we're really excited about what we're doing today, the outcomes we're delivering, the outcomes we already have delivered. And I'll tell you, we're even more excited about the potential with Predix and working with our customers, frankly to drive unprecedented levels of productivity and efficiency in the rail industry.

This is great for our customers, and it's great for GE, and we think it's great for investors. With that, it's my pleasure to turn it over to Kevin McAllister from our Aviation business.

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**Kevin McAllister - General Electric Company - VP, Services of GE Aviation**

Thanks, Seth. Thank you. Good morning. It's great to be here. I'm Kevin McAllister; I run the Services business at GE Aviation.

Now, I've been at Aviation for 29 years, 27 of it at GE Aviation, and really have had the opportunity to work in engineering, in technology, in services, in customer and product support. Really the better part of the last 17 years out with the customers in product support, sales, and now running the Services business. So great to be here today to talk about our digital transformation in Aviation Services. But first to set the stage on our Services business, we have a terrific business, driven in great part by a great installed base. Today we have 35,000 engines, and when you look at it, we power two out of every three flights worldwide.



Given the investments we've made over the last 25 years, we also have a very young fleet. 61% of our engines have had one or less shop visits versus the three to five you expect over the life of the engine; and we see good, sustainable growth in shop visits over time.

Today we have a backlog of \$115 billion, and you can see good mix across multiple product lines. Now that represents, what you see in the top line, the True Choice flight hour agreement, where customers turn over to us over a 12 to up to 20-year time frame maintenance cost on a dollar-per-hour basis. Now, this is a terrific opportunity for us to drive productivity inside of GE by improving time on wing and by reducing cost of shop visits.

But it's also a terrific platform to drive productivity for our customers: less unplanned maintenance, less disruptions, and better fuel burn over time. We'll walk through today how digital and analytics helps us do that, but it applies also to the other three products we offer in the market to our customer base.

Another hallmark of GE Aviation is our investment in technology. Now we talk a lot about -- how does technology move forward from a GE90 into a GEnx into a LEAP engine and then a 9X. But in the Services business, our focus is to move technology back into the installed base. We do this to give value to our customers in the form of increased time on wing and increased fuel efficiency.

If you look on the far right, the CF6-80C2 powers the Boeing 767 and the 747. That has been out there over 30 years, and you can see the improvements in both time on wing and fuel efficiency.

That matters. That's value in the off-season, and when you can create value in the off-season you can sell value when you're bringing services to the market and parts to the market and engine campaigns to the market. It's also a benefit to us, because it keeps fleets flying most economically out there.

Let's talk a little bit about digital. We'll start with monitoring and diagnostics.

We monitor today 35,000 engines out in the fleet. Now, we've been doing this for 20 years. About a year and a half ago, we migrated our diagnostics platform from a legacy platform into Predix.

I want you to recognize the volume of records that come through this, being 100 million per year. What was amazing for us is the incredible advantage the Predix platform gave us.

It took the fidelity up 30 points; that's 30% less alerts. It allowed to detect 25% more issues on wing, and it gave us 12 points of improved accuracy. To put that in perspective, that's more value in the first year in improvement of accuracy than we had over a decade before.

So why digital analytics, and why is it so powerful in a service environment in Aviation? Well, take a look at a map of a day in Aviation.

Now, when you think about the variation on this page, you've got engines flying in hot environments up to 130 degrees Fahrenheit; you've got engines taking off in cold environments at minus 50 degrees Fahrenheit, in salty and sandy and dusty environments -- and in some cases, all the above. You've got engines that are climbing at a slow rate or a fast rate, taking off with a lot of thrust or less thrust, flying short flights or long flights.

All this constitutes a bunch of variation. Now, the intersection here of value is engines give you a lot of data. So you have the opportunity to take a lot of variation and data by engine, and intersect those as a toolkit to find ways to better manage individual engines on wing.

Let's use -- let's look at a couple of examples. First, at the engine level, it allows us to take the analytics of, in this case, environmental analytics. In this case it's dust concentration or airborne particulate concentration around the globe.

But if you look at the middle bucket, and allows us to look at each dot, representing an individual engine and an individual take off. Now you can see the orange dots are Operator A, while the blue dots are the rest of the fleet. This allows us to look by engine at the variation you can see on this page within one individual operator compared to the rest of the fleet. Or, as you get to the far right and you look at time and climb power, you can look at variation within a customer, in this case, segmenting between longer flights and shorter flights.

Now, why does this matter to me? Because the opportunity to go better optimize takeoff thrust and climb power has a direct derivative to the maintenance cost and the maintenance burden and the time on wing of our engines in the portfolio. But it's of value to our customer, because if they can optimize both these parameters it means better fuel burn over time, which still represents the highest variable cost that an airline has today.

Here's two examples where physics meets analytics. I show you these because they are both issues that we would not have solved with physics alone -- well, certainly not in the time frame that we solved them.



On the left, you can see a high-pressure turbine blade at Carrier A. Now, this blade began to show distress, resulting in early removals, that we were not seeing in other areas of the fleet.

Now our engineers did exactly what they do very well. They got the parts, they mapped the distress, and they started to go through the engineering analysis of what could cause this distressed result and removal.

But in the same meeting were our data scientists, the science of this product. The data scientists stood up and said: Look, I found a correlation between the percentage of takeoffs from higher-altitude airports versus the distress that you're seeing on these parts.

Now, why is that a convergence? Because the engineer is thinking about how the part's designed, what temperature it ran at, how it was manufactured. But the data scientist was thinking about where it flew. So the ability to bring both of those together allowed us to isolate this condition to Carrier A, which means we didn't have to go pull 100-plus engines from the 18,000 engines in the fleet to begin to go look if we saw this elsewhere.

It meant we didn't have to take the cost of managing the fleet differently, and it meant we didn't have to create the disruption. So by engine, we're able to look at how Carrier A compared to the rest of the fleet.

Here's another example on the right on an engine powering a regional fleet. This is one operator who had 12 engines, six airplanes, operating with more distress than the rest of their own fleet. Now the ability of the data scientists to come in and say, look, we found a correlation to low cruise altitude -- those were not intuitively obvious in either case to the engineers working on the part.

But it allowed us to isolate the maintenance actions to only six airplanes in the fleet. This is a great opportunity to get down to actions by individual engine in a world of variation.

Now for me the real enabler here is the ability to move from reactive to predictive. This is an example that looks at a high-pressure turbine shroud in a GE90 on a Boeing 777. Now you can see on the upper side of the picture that shroud as removed in a harsh environment, a hot, sandy, salty environment; and you can see a lot more distress on that shroud than the population below it.

Now, in the old world, when you saw distress like that, you would begin to pull engines across the fleet. You would begin to model around the average indication you were seeing.

This chart shows that managing averages does nothing for you. You have to be able to segment variation of fleet so you can get down to actions by airline and by engine.

Now, the ability to understand predictably how damage accumulates also matters, because I can tell you that if you have to pull an engine unscheduled on a Boeing 777, it doesn't make your customer base very happy; it doesn't make the passengers happy; and it's not great for the business. What we've been able to do with analytics is look at those engines flying in nominal environments and have a very different maintenance action.

We have eliminated on-wing inspection for this condition out in the fleet. And for those that are in the harsher environment, you can see the dots beginning to converge towards nominal environment, because we can prescriptively take maintenance actions by engine out in the fleet before it gets to the blue line when you have to take it off-wing.

Now, we've talked a lot about today about how analytics is helping us manage time on wing of engines. It also unlocks a tremendous opportunity around costs.

It's the ability -- if you know how distress is accumulating by engine, by part, you can workscope these engine on-wing. You can begin to design what you want to do when that engine comes off.

That means that you can optimize the cost you're going to put into the engine when it gets into the shop. Aside from the benefit of cost productivity in doing this, it's also better planning of your materials and of your resources, and it will give our customers back value and better on-time delivery and faster turnaround time.

Now, I've been in the Aviation Services business for 27 years and, let me tell you, I've got jet fuel in my blood. This is a business and an industry I love. And I'll tell you I haven't seen really a bigger shift in how we work than what digital analytics is doing to our business.



To me, it's simplification. It's the ability to go after the things that really matter to us, creating customer value, keeping engines on-wing, attacking cost, making our operations more efficient. And we see this as value to customers in reducing maintenance burden.

We see it as an ability to learn, understand, and put better differentiated offerings out in the marketplace. We see it as an emerging suite of productivity tools to attack cost. And fundamentally, it's a faster, simpler way to drive decisions deeper into the organization, and a lot funner environment.

Thank you very much. And with that, I'd like to introduce Jeff Connelly.

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**Jeff Connelly - General Electric Company - VP, Global Supply Chain of GE Power**

Thank you, sir. Well good morning. I'm Jeff Connelly; I'm the Supply Chain leader for our Power business. I'd like to just spend a few minutes this morning picking up on where Jim Fowler was on the digital thread and talk about how it's really transforming our engineering and our manufacturing functions in the business.

Now I've spent the better part of my career at GE in various supply chain, manufacturing, and quality roles. I've bought material, I have run factories, and I've led quality teams.

I can remember in those early years placing purchase orders with my suppliers, printing the form, stuffing it in an envelope, and sending it out in the US mail. Not long after that came our first ERP system. Shortly after that we got a taste of our first email, and our new voicemail system was really cool. So those experiences, yes, they were transformative, but I can tell you they pale nothing -- they pale in comparison, in no way like what we're seeing today with this wing-to-wing digital transformation that is basically changing the way thousands of our colleagues do their jobs every single day.

Now the supply chain in GE, as you can imagine, is large, it's complex, it's very global. We've got transaction volume to operate this Supply Chain that's just massive.

So the digital thread that runs through can really help generate tons of productivity in how we handle these transactions. Our digital thread connects engineering and manufacturing with our 3D model-based enterprise, which feeds our network of Brilliant Factories. Our Brilliant Factories are outfitted with machine tools that are sensor-enabled, and these sensors transmit tremendous amounts of data into our Predix system, which allows our plant managers to more effectively run their operations.

So we're literally digitally connecting our entire global supply chain. When we think about what that means to our process in the supply chain, our engineers, instead of coming to work every day and dealing with two-dimensional, paper-based, 70-page blueprint packages that can take sometimes up to eight weeks, they're now designing in an integrated and collaborative system in 3D, which allows us then to transmit 3D PDF drawings to our suppliers that could be halfway around the world, to all of our factories, in many cases in less than an hour's time.

If you are a design engineer or a manufacturing engineer working with our factories or with our suppliers, you now have a database that can help design, automatically design fixtures for our machine tools and save tremendous amounts of time through design reuse and automation versus the manual processes that they use today. And if you're in our Services business, you now have a single source of truth that will last for the 30- to 40-year life cycle of our power plant, with great capability to capture revision history, to do instantaneous updates on the fly, and provide these changes directly into the model.

So the model now becomes the master. Our model-based enterprise, a contemporary ERP, all feeding a Predix system, it really transforms our Supply Chain operations into a true digital enterprise.

Now, what does that mean for us? Well, we piloted this now -- we started a couple years ago in a lot of our major factories. This is an example from our flagship gas turbine manufacturing plant in Greenville, South Carolina. The results have been nothing short of fantastic for us.

Our design engineers, prior to this digital thread that we started to link in, would have to operate in numerous disconnected systems to do their job. So aerodynamic analysis, heat transfer, stress and vibration, all done in separate systems, are now able to be done in a single instance, which is providing a tremendous amount of productivity and automation, allowing us to put a lot more activity through the same team down in Greenville. We are now at a point where all of our new designs, our H-class turbine, all of our new upgrades are 100% digital; we've got over 12,000 digital designs since we started the process.

And the results, we model conservatively \$100 million of benefits over the three-year period since inception. We're about halfway through that journey now.

We're automating process steps. We're eliminating non-value-added work. We're saving a tremendous amount of hours across the system.





The sensors on our machines are generating tremendous productivity by providing proactive analysis that our plant managers can use to keep our machines running. And we've eliminated a number of manual inspection points across the process, which is dramatically improving our quality.

Now all this transformation is now becoming part of our internal digital ecosystem. You've heard about a lot of ecosystems here today. These design models, when you couple those with the efforts we're making in advanced manufacturing, which is allowing us to do things in our factories that weren't possible before, when you couple that with things like our full-speed, full-load test facility in Greenville, this new facility allows us to fully test in live operation our new designs.

We've got over 6,000 sensors in this facility, collecting terabytes of data on every single turbine that runs through there. What this allows is faster acceptance of our new products by our customers, by our EPC partners, by financial institutions who are financing these projects, and by insurance companies who want that confidence that our turbines are going to perform as expected. This has been a major game changer for us in the industry, and it also provides a great library of data for that specific unit that could carry on throughout its lifecycle.

All this together generates real value for our customers. Just this ecosystem alone can take a gas turbine that we're providing for our customers and add \$30 million per unit of additional value that they can recognize.

Now, all of this has to have tremendous outcomes for our business and for our customers, so this is a chart that compares our newest H-class gas turbine with our flagship F-class turbine that has been really a fleet leader for the past 20 years. We've got about 1,400 of those units out in the field.

The chart on the left shows that with all of this speed and productivity, we are closing in on recognizing our 100th customer technical selection of our H-class turbine four years faster than we previously had customers select our F-class turbines. So this is a major progress we've made in this market largely due to our ability to simply work faster, work more reliable, and this is what the digital transformation has done for us.

Similarly, the chart on the right talks about our cost programs that we have. What this chart will show you is that within one year's time we've been able to reach our 30% cost target on the H-class turbine. When expressed in dollars per kilowatt, we've been able to achieve those goals on the 10th turbine, where it took us till the 1,000th turbine back in the F-class to achieve that same result. So it's terrific real application and results of all of our efforts.

We also have to talk about additive manufacturing in this digital transformation. Now, this all started almost four years ago when our Aviation business acquired Morris Technologies. Since then, the additive revolution in GE has spawned a new dedicated additive center that we just announced and opened early this year in Pittsburgh. We now have hundreds of machines operating in all of our businesses and in all of our factories and labs around the world, building tooling and fixturing, rapid prototyping, and actually now working our way up the chain to build more and more critical production parts in all of our businesses across our industrial footprint.

So the digital transformation and engineering and manufacturing is making great progress. It's well under way. We've got a lot more to go.

And with that, I'd like to say thanks and introduce Maryrose Sylvester.

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**Maryrose Sylvester - General Electric Company - President & CEO of Current, powered by GE**

Thank you, Jeff. Good morning, everyone. Pleasure to be here with you.

I've been at GE a long time. I started as an intern, and my last two assignments have been really exciting, leading up to my newest one leading Current. I led the industrial automation and software business, Intelligent Platforms; and then most recently the last four years had the opportunity really reinvent our Lighting business as we really led our way through the tech transformation to LED.

But eight months ago, I got the thrill of a lifetime, and that's to really lead GE's newest business called Current. Along with a fantastic leadership team, we get this opportunity to create a new GE business, a new kind of business that really builds a new market. And that's what I want to share with you today.

Here's what we're doing. We're really leaning into two transformational forces in the industry. The first is digital and the second is Distributed Power. We think we have this opportunity to bring these things together and create, as I said, a new type of business and really build a new market.

Here's how GE is going about doing that. We're bringing together the GE Store systems that we've been incubating and developing: LED, solar, storage, EV. Each of these technologies on their own could be significant businesses; they're all activating, the market's growing, and we've been investing.

But we're not stopping there. We're bringing that together with the GE Digital capability, sensing-enabling all of these assets.



When you think about something like LED lighting, it's not only digital, it's everywhere. So you can sensor-enable it and collect valuable information for your customers.

Then we're working on the Predix platform on our killer apps. Ours are all around energy management to help customers extract value from all of those assets when connected together. But then we have the open platform, bringing ecosystems of developers that can help us help our customers go faster and extract even more value out of those assets.

Then we're bringing together new business models. There is so much opportunity here to make buildings and enterprises more efficient, and sometimes a constraint can be capital. So we're trying to create new business models to let customers go from a CapEx model to an OpEx model, creating Power-as-a-Service, Energy-as-a-Service, Lighting-as-a-Service.

As we do this, we're no longer selling discrete components to customers. We're selling a platform. But most importantly, we're delivering outcomes to customers.

So we have to sell in a whole new way. We're hiring terrific sellers that can help us connect to the C-suite of CFOs, CIOs, VPs of real estate, VPs of energy.

I want to talk about how they get more out of their assets and how we help them deliver new outcomes. For us, those outcomes are all focused on reducing their energy usage, producing power on-site, shifting their demand pattern so they can pay a lower kilowatt price per hour, and then optimizing everything that goes on in their environment.

This is where we're going. We're trying to run this business like a startup because we really are doing something different here, and we're thinking about it in a wave strategy just like a startup would.

We think we have three significant waves to work through, and I'll tell you a little bit about those. But what allows us to work from wave to wave to wave, and in between the waves, and back and forth is really our technology stack. That starts with hardware, then moves to control, and then to optimization, and then to grid-level services.

For instance we'll start Wave 1, where we go into a building and we look to deploy assets to help them be more energy-efficient, so it could be LED or EV charging; or to help a customer produce power on-site, typically through solar. So we get into the building and help make it more energy efficient.

Then we want to control and optimize all of those assets, GE and non-GE assets. It would be our lighting, solar, HVAC, every plug-load device, even sprinkler systems that consume energy for a customer, and help them optimize the asset, all of the energy-consuming and -producing assets in a building, and then all of those assets across their buildings.

Our customers are going to have 500, 1,000, 2,000, 3,000, 5,000 sites that they are looking to optimize. So in Wave 2 we help make them more efficient, and as we have enough of these assets under management, controlled, efficient, producing power, and optimized, we can start our Wave 3 strategy, which is really to build a virtual power plant to allow us to help take power and project it back to the grid, make the grid more efficient and stable, or orchestrate this excess supply and capacity across our network of customers.

So that's where we're going here with Current. I want to share with you what we're doing in Wave 1 and Wave 2, because that's where we're the most busy today.

Typically our customers will be a commercial, an industrial customer. Big customers with a lot of important work to do, big brands. Their primary business is selling things, banking, retail; they have a lot of important work to do.

But they are also huge, huge energy consumers. They will spend hundreds of millions of dollars a year on energy to run their enterprises.

We're showing them there is a whole new way to think about this energy infrastructure to get more value out of it. What they need from us at Current is a trusted advisor to help them move through this wave of opportunities.

We will sit with their CFO, CIO, VPs of real estate, VPs of energy and help them understand the opportunities or the outcomes we can unleash for them, and show them the possible, and then work with them on the technology stack that we think makes sense. I'm going to spend a minute with you on the technology stack so you understand how we extract these values and outcomes.



We typically go into a building and start with either producing solar on-site or doing a major lighting conversion to LED. Right there we can pencil a significant energy cost reduction for our customer.

Once we're in the building, we then seek to digitally sensor-enable every energy-producing and -consuming asset so we can help the customer understand what's going on. Now that we've tagged all those assets and we have them, we need to be able to get that data and control that flow of energy.

And that's where the Daintree acquisition that Khozema talked about earlier this morning is so important to us. Daintree is a control and communications platform, a standards-based, open system that's open on the bottom, it's open on the top. It allows us to connect to anybody's machine.

And because these customers' machines are so vast, so massive, so dispersed, Daintree's the perfect solution for us. So we bring that data in from the center to the control, then we can help a customer across 1,000, 2,000, 5,000 sites put rules in place for how they want to turn their lights on and off, the temperature they want their HVAC set at, how they can really optimize performance while protecting the customer experience and improving the customer experience. And bring it all back into a supervisory control that has faulting and alarming so they have control over their dispersed footprint.

Now, once we have the data and the controls, we bring it into our Predix platform and we really work on optimization. Again, optimization of the asset, of the building-wide assets and the enterprise-wide assets. Our killer app is really our Energy Management platform that I'll share with you here in a minute.

But again, once we have it on our platform, we have an ecosystem of developers helping us develop incremental applications that continue to extract value for our customers. You can see the kinds of opportunities we'll unleash for customers: they can reduce their lighting energy cost by 50%; they can improve their overall energy optimization by 10%; lower their kilowatt price; avoid peak demand costs; produce power on-site; then eventually project some of this capacity back to the grid.

As I said, we are just getting started. We've been at this for eight months. We've been launching and piloting our Energy Management Predix application. We're focused right now on the banking and retail space.

We've got pilots going with 10 significant customers, on average piloting across 10 of their sites to try to understand the possible and the kind of opportunity we can unleash. This is an example of one of our pilot customers and what we're talking to them about.

We're helping them look at how they optimize how their HVAC, the rooftop units, all of their plug-load devices, how it comes together and how they figure out where they've got asset opportunities to take the inefficient assets out of service or do predictive maintenance, bringing them up to best in class; and then how to run all of this equipment together to avoid peak demand charges. So you can see when you do this in combination with doing it at the time of an LED installation, you can help a customer save \$200 million a year when this is deployed across their entire footprint. A three-year payback for them, which is terrific. And we're just getting started here.

Customers are really excited about this. One of their comments was, when we were working in pilot mode and modeling this capability, they said: We knew there was an opportunity here to be had; we know optimization is a major opportunity. We've been trying to get at it with a lot of people; we've been spending 11 months trying to understand how big our opportunity here is. You've shown us in four hours that we can save this kind of money, and we know this is just the beginning.

So we're very optimistic about where we're going here as Current. We're eight months old. We've got a \$3 billion pipeline; we're gunning to be a \$5 billion business by 2020.

And we think this is just another proof point of GE building a very strong digital industrial business. Thanks for your time. I'm going to turn it back over to Jeff Bornstein.

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**Jeff Bornstein - General Electric Company - SVP, CFO**

Okay. That's a solid three hours. I've just got a few wrap pages here, a little housecleaning, and then we're going to take Q&A. Bill and I will take some Q&A, or if you want to ask any of the presenters a question.

Let's try to do that in maybe 15, 20 minutes or so. Because we definitely want you to go over to the foundry and see some real live demonstrations, see the Dojos, etc., etc. So I'll move through this quite quickly.

No change to the framework for the year, \$1.45, \$1.55 of earnings. We still think we're on track for 2% to 4% organic growth here for the year.



As I talked about earlier in the year in January after the fourth quarter, and then again in April after the first quarter, as it relates to orders, sales, margins, and cash flow we're very second-half centric this year in our plan, but we feel like we're still on track with all the guidance that we've already given you.

No change to our view on cash flow, and no change in the view that we're going to deliver \$26 billion back to investors through buyback and through dividend.

We closed the Haier transaction on Appliances a couple weeks ago. Total proceeds were \$5.5 billion, so they were a couple hundred million higher than we thought they would be, largely because there was more working capital in the business at the time of closing, which they paid for. It's a little over a \$3 billion gain pretax, and about \$0.20 of EPS as we described to you previously in the quarter.

We expect that to be partially offset in the quarter with about \$0.10 of restructuring, thereabouts, plus or minus. And again for the year, we expect gains and restructuring to largely offset.

On the GE Capital side, \$171 billion of signings to date; \$156 billion of closings. We signed the French platform last night for \$6 billion, so signings are now \$177 billion.

Before we were at \$35 billion of asset transactions to go. We're now at \$29 billion, and I think we feel pretty confident that that will get executed here in the second and third quarter. We'll be largely through most of this work before we get into the fourth quarter, which is great. The GE Capital team has done an absolutely outstanding job on execution here.

This is the walk Jeff talked to you about at EPG: \$1.31 last year; we'll get \$0.32 accretion through buyback and reducing the number of shares outstanding. We feel like we're still on track here for \$0.15 to \$0.20.

On Alstom, I said earlier our confidence continues to grow, not just in the cost synergies but also how we can create value by selling more product and pulling through both Alstom and GE product through those platforms and those technologies. We expect organically to grow op profit between 2016 and 2018 about 5%, which puts us on a path to be plus \$2.00 a share when we get out to 2018.

On the ride there, we have a very attractive dividend yield; we're at least 100 basis points in excess of the average S&P 500. The GE Store is really delivering, part of what we were trying to tell of the story today: not just about digital but about the value-add of the GE Store. That's why it makes sense to have these set of businesses in our Company, and the GE Store is how we create incremental franchise value in each one of these businesses.

So you heard our story today. We are 100% committed to this space. We absolutely believe that this is going to be a game changer in the industrial space globally over time.

We think we're positioned very well. We think we're uniquely positioned to deliver the vision of what is Predix and the industrial Internet, our deep domain, our technology, our physics.

One thing we didn't talk about a lot today was sometimes the analytic insight you get from Predix and this capability, your solution set may be to actually physically change the asset itself: a different coding, a different tolerance, etc. Those are things we can only do within our own installed base.

We do have the ability to do it on some other OEM equipment, particularly in the Power & Water space. So listen, we've got a set of capabilities, we've invested to win, we have a great team. I heard Harel mentioned earlier that we lifted the Siri founders from Apple; we have no problems hiring the very best talent in the world in the deepest parts of the technology that we're developing here.

So that's our story today, and if you've got questions, Bill, why don't you come on up and we'll take a few questions. Scott?

#### QUESTION AND ANSWER

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**Scott Davis - Barclays Capital - Analyst**

Thanks and good morning, guys. I wanted to get a sense of what kind of early feedback you're getting from your beta customers on Predix and what the shortcomings are. What are the things they want you to fix in the next year for a 2.0 version or --?



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**Bill Ruh** - *General Electric Company - SVP, Chief Digital Officer, CEO of GE Digital*

Generally, I think -- three things that we continue to work on. One is security. Everything we have to do is continue to secure the system and their systems, and while we're at the same place for us in the market or better than the rest of the market in what we're doing, I think security is on our mind a lot.

The second thing that we see is we're in the early stages of helping them build these asset performance management solutions. So the kinds of things we see are actually pretty small, like features and functions that they want to see about how they want to manage their products.

So at Pitney Bowes, they wanted a little more focus on some optimization. When we were working with LIXIL it was scheduling.

So I would say they're very normal features and functions we have, but they might want some uniquenesses added. But nothing like -- we don't see major concerns in there.

But I think we do -- they do want to see more in the machine learning space and more -- especially as they put more data in the system, I think everybody wants to have just better insights. We're looking to what we can do to continue to add machine learning into it.

The final thing is I think the real issue for us is global coverage. You heard we have Saudi Electric, so we've got to get coverage into Saudi and so on. So as we get customers, I'd say the biggest issue, other than what I'd call the things that are hygiene that we are focused on -- and I'd call a lot of what I just talked about hygiene -- the biggest focus is global coverage. Because we're finding that it's not the mature markets that are just growing in this; we're finding the emerging markets is a great opportunity.

So I'd say that we're spending a lot of time figuring out how do we expand global coverage at the fastest rate. And that's probably the biggest shortfall today that we have.

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**Scott Davis** - *Barclays Capital - Analyst*

Just a quick follow-up. You spend a little time talking about Brilliant Factory, but what is your current penetration rate? What percentage of factories do you have now that are what you'd characterize as Brilliant Factories? And what ramp do you see call it next five years?

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**Jeff Bornstein** - *General Electric Company - SVP, CFO*

Jim, do you want to take that?

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**Jim Fowler** - *General Electric Company - VP, Chief Information Officer*

Sure, so you mean inside the Company?

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**Scott Davis** - *Barclays Capital - Analyst*

Yes.

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**Jim Fowler** - *General Electric Company - VP, Chief Information Officer*

So inside the Company, we are deploying to 75 plants this year with a commitment we'll actually get to 91 of the 450 plants on a basic connectivity. In that there are seven plants that we want to have mapped end-to-end wing-to-wing on the full Brilliant Factory capability.

So you'll see us get as many as 90 connected out of the 75 we committed. And you'll see seven be wing-to-wing and the rest will have point solutions in each one of them.



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**Jeff Bornstein - General Electric Company - SVP, CFO**

This is important. Not just because it delivers, we think, \$1 billion of productivity run rate when you get out to 2018. It's important for customers. It's important as a selling point to actually see it wing-to-wing in action and having people be able to visualize and see how it's massively changed how we operate our own Company. Cliff?

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**Cliff Ransom - Ransom Research Inc. - Analyst**

Thank you. I drank your Kool-Aid about three or four years ago, and so I've been looking at this potential in my industrial world. There is a headache that I think is coming up that you seem to feel, at least in the overall presentation today, and that is: Who owns the data?

You get national airlines, you get healthcare systems concerned with HIPAA, you get municipal water utilities who are telling these guys who are trying to connect with water meters for heaven's sake -- and what could be less sensitive -- that they own the data.

To me, at least if I've understood you correctly, the real key for you is to build big enough systems that you can get to the granular stuff and add value per engine, per meter, per connection, or whatever. Are you really convinced you've solved all those who-owns-the-data issues?

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**Bill Ruh - General Electric Company - SVP, Chief Digital Officer, CEO of GE Digital**

I think there are three issues in who owns the data that I want to raise -- and you touched on at least two of those. First of all, from a regulatory perspective, this is where it's been a lot of emphasis in place.

If you look at the healthcare cloud, it meets all the regulatory requirements that our customers have for managing data; HIPAA here in the US, but there's quite a bit as you go outside the US as well.

On the Aviation side, by the way, there's regulatory considerations for Aviation as well in protection of data and so on. So the regulatory stuff is built in.

That is -- the customers just care that the regulations are being met in there. So we can check the box on those for the customers we deal with.

The second one that you didn't mention but I do want to talk about, because it goes back to my global coverage issue: there are data sovereignty issues that are not customer issues, but they are country issues. Countries like Saudi Arabia, China, Germany, for example, have regulations about data not leaving the country.

This gets to -- you have to be able to do the processing in-country. That's why the global coverage becomes important, because around the globe there are lots of countries where you have to understand data sovereignty, which is another form of regulation, but we're dealing with as well.

By the way, most of the cloud providers aren't really in a lot of these countries where data sovereignty is a big issue. So we're having to deal with that.

The third one is the customer question. I have to say, this is -- I alluded to this a little bit. Industrial customers are actually very different than consumers. Consumers have almost given up and are allowing their data to be used without any real rules or consideration.

Industrial companies are quite different. When we go in and negotiate, this is always a topic of discussion.

So when you look at Predix, we have already stood forward and, for our customers, there are two things we're very clear about. Look, they own their data and they have full control over it. So if you look at Predix, the security controls a lot of them to encrypt it and only they can see it and they can own the keys.

So in the end, they can fully control their data if they choose to do that. And we're very clear with our customers they own the data.

The second thing is IP, and I'll come back to one last thing on the data, but I do want to touch on IP. It's an open system, so our customers have the ability to add value on it. We clearly own the IP we have in Predix, but if they build something on it, they can own that IP. So there's a clear ownership of IP and data.





Now with that said, with most of our contracts we have IP rights to do certain things, and the customers and we are agreeing to those things, but it's very clear. The reason why is if they want to get fleet analytics where we are taking our data and allowing them to do comparisons with our data and their data, we will get an agreement to allow them to share that particular data with us, and then that allows us to use that.

But we are really -- they still own their data, but we are not -- this is the difference I think between the consumer and the industrial. In the industrial world, you are going to be very clear on IP rights with data and with software. And the only place in the middle is if we co-create code with our customers, then of course we are always negotiating specific rights.

But to be very clear, it's all in our contracts. There's no lack of clarity. The customer owns their data and IP. We own our data and IP, and we are looking for ways to -- they see value, we see value, that we are very clear about the sharing. We found that that's working very well out in the market today.

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**Andrew Kaplowitz - Citigroup - Analyst**

Jeff, one quick one for you and then one for Bill. So do you think that Predix in general has the potential to change the value gap equation for GE or maybe digital in general as we look forward?

And then for Bill, you talked about 20,000 developers, 50 partners. How do you know that that's enough? How do you benchmark yourself versus competition? The software guys are out against you. I'm sure some of them have more than that in terms of developers. How do you draw the leap from 20,000 developers to \$4 billion in sales four years from now?

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**Jeff Bornstein - General Electric Company - SVP, CFO**

So on value gap, you mean price versus inflation, etc.?

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**Andrew Kaplowitz - Citigroup - Analyst**

Yes.

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**Jeff Bornstein - General Electric Company - SVP, CFO**

Yes. So a theory of the case is that the more successful we are around changing outcomes, the more differentiation you have around our products; not just our service products, not just our software products, but our original equipment products. So the theory of the case, whether you decide to exploit that in terms of share or whether you try to exploit it with better price, we think ultimately there is something there. Very hard for me to quantify for you today whether that's a point of price. That I can't really do. But we absolutely believe that it can be a massive differentiation for the Company.

As it relates to your question on value for the Company, here's what I would say is today, most of what you saw is how we think about the Company on a go-forward basis. Some of that materializes over the walk from 2016 to 2018.

What you all own a completely free option on is that Predix really becomes Predix for the world; that this is an operating system that's adopted as one of a few operating system solutions for the industrial Internet for the world. That value is not in \$31 a share, it's not in \$2 plus in 2018. That's a free option every single one of you have that if we really execute against this and the opportunity is as large as we think, that is all upside.

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**Bill Ruh - General Electric Company - SVP, Chief Digital Officer, CEO of GE Digital**

I think there's three things I want you to consider. One is within GE, we talked about our goal is hundreds of applications by 2020. That would put us in order of magnitude from where we were, let's say, a few years back. So we are talking about just increasing by a significant amount what we have inside the Company.

And then we talked about thousands of applications outside, I think, that if you look across the world in industrial apps, it's sort of like where the consumer world was before the smartphone; you had hundreds of thousands of apps. And in the industrial, you have hundreds of apps, maybe thousands.



We are talking about taking the number of apps in the industrial world up in order of magnitude which means more choice, probably greater value for our customer base. So we're talking about trying to get 100,000 developers on to that. We think that would be larger than the number of developers working on industrial software, but I think that's how we look at it.

So we don't think it's going to look like the consumer world, millions of apps and millions of developers, because domain knowledge we think is important. So we think those numbers are in line with increasing the overall size of the creation of IP in the world today in this, which I think is going to be of great value to everyone.

In terms of the \$4 billion, I would just leave you with this thought. If you think about how we think about that coming out, first of all, we are looking at enterprise customers. We see those enterprise customers as signing contracts that are between \$25 million and \$50 million over five years. And that's what we're seeing in these early days, so we think that will hold. We'll probably go from 10, 20, 40, 80 to 160 in that timeframe, and our target is really 150 customers with that kind of value per year.

The second part of the equation for us is the partners. We are really thinking the partner base globally is closer to 250, so we go 50, 100 and so on. When you look at those, we think there will be a top 20 list out that we will be talking about between \$50 and \$100 million generated through them and with them. And then we think the vast majority, the rest might be average sales of, call it, \$5 million to \$10 million per year as we grow that.

The third thing is we are bringing the former GE IP and our suppliers into the mix, and that will be the third wave. We are doing that today. So how do we convert 10,000 of our GE IP customers into Predix? You saw P&G. And then the thing that is untapped is we have 20,000 suppliers. If you are a supplier, you are going to be on Predix. So we are going to go after our suppliers to work together to create that.

So the equation is 150 big customers, 250 partners globally. And then the third equation is mining the GE IP and the supplier base. And then, of course, I just want to be clear the big win is the outcomes that the business is driving to get to \$10 billion. And that's really for them to take, but don't forget that has a lot to do with Predix. Does that help?

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**Nick Heymann - William Blair - Analyst**

I guess a couple of simple questions. One, you've talked about \$15 billion in revenue by 2020. Can you scale that in terms of, is that kind of a 10% of GE's revenue base? And more importantly, what will it be in terms of earnings for GE prospectively by the end of the decade?

And then secondly, you've alluded to acquisitions in this space to get to where you're going. You have made Daintree. You hired a team. Is it really more about hiring people than buying companies? And what kind of a capital commitment might you be thinking about over the rest of the decade?

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**Jeff Bornstein - General Electric Company - SVP, CFO**

Okay, that's a lot of questions. We haven't talked about a 2020 revenue number. I think at \$15 billion, it's a meaningful piece of the portfolio, no question about it. In terms of profitability, you have a sense for the profitability of the core of what we do today through software and upgrades. It's 30% plus margins.

Productivity, to the extent we deliver it, which I'm very confident we will, by definition is 100% margin. And those platform sales, they have the \$4 billion Bill was just talking about, should be highly, highly accretive to the Company.

So I think from a profitability perspective, if we deliver \$15 billion it's a meaningful increase from an accretion perspective of profitability on a go-forward basis and well above the average of what we earn today. I think that's a fair assessment.

On the M&A front, it's a combination of focuses. One is fitting this puzzle together; where is it that there's a technology or a capability that we think is critically important we own? And we own it either by organically developing it or maybe by buying it, but that we clearly -- it's not something we want to partner, it's not something we want to share, etc.

Another axis to consider is time. So this is absolutely a race against the clock in our view. So there are times when we are evaluating a technology capability -- and that may be a piece of code; it could be a data set; it could be a group of people -- where to build that organically, we are looking at a 12 or 18-month timeframe, and we are not thinking in terms of 12 and 18 month timeframe.



And we may choose through M&A to accelerate that capability to today. That's really important. We've done -- the deals we've done so far I think have worked out very, very well, and we will continue to do them. They've tended to be on the smaller side. We haven't done multibillion-dollar kinds of deals, don't know that we'd ever do a multibillion-dollar deal.

Most of what we're talking about now is filling in these puzzle pieces so the thing comes together the way we want and it's as competitive as it possibly can be.

And then I can't remember your third question, Nick, but --

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**Nick Heymann - William Blair - Analyst**

(inaudible - microphone inaccessible).

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**Jeff Bornstein - General Electric Company - SVP, CFO**

There's definitely a piece of that. Now when you think about -- so the last capital allocation plan we gave you, we talked about \$10 billion of M&A between 2016 and 2018, within the framework of the existing capital allocation. And there will be a piece of that that will absolutely be dedicated and is being dedicated to this entire effort.

I would just remind you that we also think over this period of time we very may well decide to add additional leverage to the Company. And we've talked about something like \$20 billion of potential capacity over time, which gives us a lot more flexibility around how we think about M&A as well; if there are opportunities to deploy that capital at returns that we think are a good deal for investors and accretive to the Company.

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**Shannon O'Callaghan - UBS - Analyst**

A question for Bill. I'm curious on your perspective on the limitations of existing automation systems. If you take somebody like Emerson or somebody with a process management business, they've had an asset management suite for 10 plus years trying to digitally communicate with assets and predict things.

What are the shortcomings of those? Are you trying to take those on head-on, or why does Predix beat them or fit in?

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**Bill Ruh - General Electric Company - SVP, Chief Digital Officer, CEO of GE Digital**

I think there's three things you ought to think about. First of all, I think that traditionally, let's call it the at-the-edge automation, controllers, etc., have been highly proprietary and less capable of storing and adding analytics over time. They are a little more difficult to manage and there's more devices going out there, remember.

So just the idea of how are you going to manage these devices, and just think of how complicated it is with the cell phones and things like that. We are talking about being able to do the same thing. We are talking about being able to upgrade it, but more importantly how do you put more data on that and analytics. And you're constantly adding value, but you have to do it in a way that you don't have to -- you can't bring the gas turbine down.

And by the way, this is a really complicated problem to solve because these things will run five years and then you're not upgrading the software on it. So you have to be able to do this in real-time while everything is running. You're going to want to constantly add more capability.

If you go back to the AGPs, we are adding a lot more control logic in software that's providing a lot of value. So I think this idea of upgradability and management and reliability combined is going to change the nature of what that kind of product is, because I think that's what people are going to want.

I think the second thing is we've been building what I would call very custom bespoke systems. We have been doing it for years where you have building and analytic that is predictive. What we are talking about is being able to do it over a large scale system on everything you own and putting it together.

So when you go on a power plant, it's not just about the gas turbine anymore, and that's why we are working with other companies to be able to build their own models and then how those models work together.



The last thing is these asset systems in the past have been transactional. Somebody fills out a form. They really haven't been about data coming in and keeping a full record birth to, let's say, death of a machine. With live analytics running and the ability to expand it has not existed.

And that's what we're really talking about, is something that goes from bespoke custom-built applications using proprietary technology to an open one where people can add more value.

And the last thing I'd say is listen to the applications we are building. They are very operationally focused. So you are going to see that people are now going to make decisions on energy trading, but it's going to be based on how the system's working in real-time. That can foundationally change the nature of these businesses.

So tying operational optimization, asset optimization, hasn't been possible before, but I think that's what we are going to see. So those are the things I see happening. And as a result, I think there will be this creativity of new applications that are going to be built and come out in the industrial world sort of like what we saw on the consumer side. Not millions, but at least let's say thousands to tens of thousands.

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**Unidentified Audience Member**

You've talked about that the compute is different; the amount of data you're collecting is different from these, quote, consumer Internet companies. Yet they are spending far more on you on data center capacity and things like that. So can you help me reconcile what seems like to me a relatively low amount of spend, given the compute and store that you need versus what those folks are doing?

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**Bill Ruh - General Electric Company - SVP, Chief Digital Officer, CEO of GE Digital**

Well, I think I'd say two things to this, and then I'd ask Harel if he wants to add to it. First of all, we have a hybrid cloud-based approach. So when you look at us, we are thinking about how do we -- we are building out some of our own data center capacity where it makes sense. And then in other cases, we are riding on AWS, Azure and so on.

So how we decide to move the workloads in the cloud around is going to be based on the best economic and speed approach to getting out there.

The second thing is a lot of that data is getting stored at the edge. You saw that Predix box, and there are just customers that don't want their data to leave their own premise. So the cloud, you're actually pushing the processing down onto the edge.

So there's this hybrid in two ways -- hybrid in the cloud and hybrid of where the cloud is truly a regional play to it's on a premise play, and how you make that work.

I think the last thing is even for us, we are in the early days of this. We are probably where the consumer guys were collecting consumer data 10 years ago. Meaning everybody's in the start and for now, most of this data is actually not getting used in this way.

And I would say you saw Kevin McAllister. It's for the first time we are bringing all this together, and it took us a while. I think all of our customers are now just galvanizing themselves. So I think you're going to see the curve really hit the knee probably about 2017 into 2018, is when as an industry we will start to see that.

Harel, anything else you'd add quickly to that?

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**Harel Kodesh - General Electric Company - VP, CTO of GE Digital**

Yes, I would say that if you look at the major currencies workload. So if you look at our workload, they are different than office workloads, different than old ERP containerized workloads, and a difference in search workload. Because they need -- if you look at a data center, the structure of those workloads as I said is highly based on GPU, graphical processing unit, and about the fundamental machine learning algorithms.

So our workloads are mostly aligned with machine learning needs, and it will not be -- it will not make sense for the other competitors to build everything along these lines because they don't have the same type of workloads.

Now as those number of workloads is going to go higher, we will go and build more and more specific data centers to deal with what we have. Maybe next year we should take you on a tour to our data center, so you'll see that the boxes are actually different.



Now I'm not saying that you cannot run those things on different data centers, but it's going to be much less effective if you did so. So we think at the end of the day, with combination of what Bill mentioned in some of the distributed handling of the data. The fact that we are really focusing on data in deployment, which is actually what we are trying to make things much more efficient on when it comes to our data center versus data in development and test, which is actually we are working with the other cloud providers to make sure that we can get the scale.

I think what you'll see is that we are going to increase the scale in our specific data centers. Frankly, it doesn't make any sense for them to increase the number of GPUs in their data center. It doesn't make any sense for us to reduce the number of GPUs in our data center. So I think you'll see a natural bifurcation of how these architectures are being built.

And as far as the spend is concerned, every workload that we have is monetizeable. So as we monetize more and more of them, we will build more and more footprint on the data center. So you will see that our investment is growing there as well.

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**Bill Ruh - General Electric Company - SVP, Chief Digital Officer, CEO of GE Digital**

Thanks, Harel.

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**Jeff Bornstein - General Electric Company - SVP, CFO**

Andrew?

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**Andrew Obin - BofA Merrill Lynch - Analyst**

Just want to clarify a couple of things. The investment on page 10 of our slide, you sort of cited \$1.4 billion in 2016. Is that a total number or is that a 2016 number? And if it's a 2016 number, what has been the total spend to date on GE Digital?

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**Jeff Bornstein - General Electric Company - SVP, CFO**

That a 2016 number. It's split between what you heard the businesses talking about around Vertical development; it's about \$400 million. What Jim and the team are driving on Digital Threat, again about \$400 million. And then about \$600 million at the horizontal Predix operating system level.

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**Andrew Obin - BofA Merrill Lynch - Analyst**

So what are these numbers on a cumulative basis?

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**Jeff Bornstein - General Electric Company - SVP, CFO**

A little over \$2 billion.

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**Andrew Obin - BofA Merrill Lynch - Analyst**

Okay. And just a second ago, just to follow up because I did ask -- the Predix ramp-up, the past, the Platform-as-a-Service ramp-up, you are going from \$50 million to \$4 billion by 2020. What's the path --?

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**Jeff Bornstein - General Electric Company - SVP, CFO**

I think that's what Bill walked through. That's the algorithm he just gave you on spend per customer, number of enterprise customers, deployment across our supply base, deployment across our customer base. That's the algorithm I think Bill just went through.



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**Andrew Obin - BofA Merrill Lynch - Analyst**

But is it going to \$500 million next year or is it going to \$1 billion?

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**Jeff Bornstein - General Electric Company - SVP, CFO**

Okay, so very, very modest between now and 2018. So there's virtually a very modest, a very little impact in \$2 plus a share in 2018.

So as Bill just talked about, we think the real ramp here is going to be in 2017 to 2018. So that's when we would expect that \$4 billion to really start to materialize.

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**Andrew Obin - BofA Merrill Lynch - Analyst**

Thank you.

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**Matt Cribbins - General Electric Company - VP, Investor Communications**

Thank you, Bill and Jeff. A couple of quick announcements if we could bring up the slide.

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**Operator**

Thank you for your participation in today's webcast. That concludes the presentation. You may now disconnect. Good day.

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