TRANSCRIPT

LIFE SCIENCES DAY

November 13th 2019

New York City

>> Bernard: Thank you, Francois-Jose. Good morning to everyone.

We are very delighted to have you here for this morning, with a rich program.

I have to tell you that, over the last two days, I've been learning much more about Life Science and what our customers and partners are doing with Medidata.

It's a good training class for me.

We want to reveal to you a little bit more as committed about what we want to do in the world of life science, because I think this industry needs to change - to say the least, in my mind.

We are excited, and I'm very excited with that perspective.

We have not done a light study about that sector: we started 14 years ago. We started really in 2009, with secret projects and I will talk to you a little bit more about those in a moment, really, to understand and socialize with the sector of both life science and health care.

The first thing I want to tell you is, at Dassault Systemes, we make bets and we formulate them in a very clear way. We did that for the last 35 years.

I'm mentioning that more for the newcomers who don't necessarily know us well.

The first bet we did is to say we are going to unflatten the world by moving drawing systems to 3D design.

Today we have built a work starting across many industries, and there's still a lot to do, but there is no question anymore about the fact that this is a must, especially in what we call the "Fabsphere," the industry at large.

Ten years later we did another bet, which is represented here, which was to say, "What can we use this to do the digital mock-up – " we call it the digital mock-up – "of an entire highly complex product called an airplane?" This was done with Boeing on the 777.

You have to know, it's a $15 billion program, 40 countries, seven years.

So, I am not impressed with the numbers in Life Science, at all, because they talk about $2 or $3 billion. When I listen, they tell me it's a very, very high number. I said, "Yeah, it is, in some way."

After they tell me is very complex, I say, "yeah, in some way."

They say, "Well, by the way, we have a lot of people involved." I say, "Yes, I agree, but I think things can change."

But there is a before and an after 1989. Because at that point in time, the entire world industry understood that the digital world could replace physical prototyping in a big way.

And it has created an incredible wave of transformation of the world industry. It's established, there are proof points on it. The automakers started to do it slowly.

And he nature of what we do -- and I want to mention that now -- since the beginning is, one, provide science-based infrastructure to manage complexity, enable to do highly complex collaborative process management of multidiscipline knowledge and know-how, and use the digital world to life-cycle things, to add the time to it.

So, that was 1989.

Then we made another bet with another company, called Toyota. And we said, "We want to do digitalization of your entire production system."

You noticed that in Q3 we mentioned that they are going to another generation. That was not minor news. It was a small announcement, but big news.

And we demonstrated to the world that we could do the digital twin, the virtual twin experience, of entire global complex production systems.

On February 9th, 2012, we published a 2-page paper where we said the new equity of the company will address three spheres: the Fabsphere, the Biosphere, and the Geosphere.

We put in those spheres in a way to look at the world in a way where we said the innovation should be at the center of this understanding about the bio world, the fab world, and the geo world – material science.

That was another bet, but I think we are walking the talk with all the moves we have done since then, and this was February 9th, 2012.

And we said, "Focusing on product is not enough. We should put these things upside down. We should create a universe where we can formulate experiences. The value of what is used in the economy, as opposed to what is sold in the economy."

That's why we called the platform the 3DEXPERIENCE platform.

Well, you can understand now, with the little symbol we have, that our goal is to do the virtual twin of an entire human body. That's what we're going to do.

We believe we have the reasons, good reasons and proof points, to make it happen.

We have started with our gains, we are working on human cells, and what you are going to see this morning is related to all the pieces coming together to make this possible.

If I were starting from that point, you would say, "Well, what's the track record from the past?"

But I believe that those kinds of bets are very clear, very precise, and I want to go through them quickly.

Before I go in the Life Science by itself, I just want to remind you where there, in June of 2018, when Pascal presented the growth plan for the next five years, this was almost without the Life Lcience world.

There was a little bit of it, but Pascal will come back on it. So this is not new -- this is what you have seen in June. We think we can continue double-digit growth in, if I shortcut it, the Fabsphere: the world of the make, design, simulation, creation, production of products and solutions.

So, that's a baseline for us on what we are going to talk about today, is really what is our ambition, midterm and long-term, for the Life Science. Basically a new corps for Dassault Systemes.

Briefly said, we are in the yellow sphere with many industries. We call this the Fabsphere.

We have initiated activities with BIOVIA, and of course Medidata. We position that set of solution in the Biosphere, in healthcare.

And the Geosphere, it's related to territories, cities, how you build the world for citizens, including energy, is being put in that world. And the numbers here are of roughly the GDP numbers in the world. Pascal will comment on the trends from that standpoint.

What it says is that the new corps is not small.

The second thing it says is that the new corps, from my observation in the last ten years, meeting customers, is far behind in understanding how the digital world can help them.

These enterprises are document-based, great PDFs, and digital documents. They are prisoners of office documents. They don't see the capacity of modeling simulation and data science yet.

Statistics, a bit, but not much more.

So, 11 industries, 61 segments. You have seven of them on the fab side.

On the Bio side you have one and a half, and then you have the other three in the world of what we call the Geosphere.

So, for those of you who are following us, you're very familiar with that.

What I want to mention here is that we have a very precise map of solutions, what we call "industry solution experiences."

Industry solutions are measured by the outcome to the companies.

Developing a car from 17 months to 15 months or 12 months, that's an outcome, and this is a real number that has happened in the last 15, 20 years.

Same for aerospace, marine and offshore, industrial equipment, et cetera. So, outcome-based, we have three measures.

Outcome-based, performance for teams to do collaboration, we call them process experience, and then making the users champion in what they do, and defining their future job.

And we call this the workforce of the future, with roles.

So we basically deliver solutions which are based on three things: roles, process experience, industry experience.

If you want to develop an airplane today, you don't need to go anywhere else but contact Dassault Systemes. 9 out of 10 planes in the world are done with Dassault Systemes software, 8 out of 10 cars, and I think we are expanding that scope.

I'm going to do an analogy here. We have moved from functionalities to outcome, process, or role-based KPIs. That's for what we have done up to now.

Now I am moving to the new core, which is life science.

I'm trying to do some analogy.

First, I think it starts from the very strong element of our equity system, the virtual world, extend and improve the real world, and I will show you why.

That was published on February 9th, 2012, so now you understand that many of the moves we have done are associated to the journey and the growth plan and the value map on those three spheres.

When I am asked the question about why is Dassault Systemes going to invest, what we do, the framework has been established in 2012 and we usually follow it with high precision.

And our purpose, because we are a purpose-driven company, "harmonize product, nature, and life with the virtual universe", I think echoes a lot of what I've heard yesterday with the great customers that you have, Tarek and Glen, built external relationships with, over the last 20 years since you created your company and really prove we have a common culture.

You have developed your group. I've done the same with my team, so we understand what it is to develop a company from a few people to what it is today.

I think that was probably the first criteria for us to decide to come together, but I'm sure you will talk about it in a moment.

So, 2009, we start a bio intelligence project.

We said, "We are going to put science in this process." Then we move and do the Accelrys acquisition, which is an extremely powerful platform for material science and bioscience.

By the way, I present to you something constituted of 28 elements: myself.

You are 28 elements of the Mendeleev table. Not 29, not 26. Only 28 elements of the Mendeleev period table makes a human.

And its 58 elements here [showing mobile phone], 58 here, 28 here.

Think about it. People don't think about it that way, but that's an interesting perspective. Very interesting.

By the way, I mentioned Mendeleev because it's the 150 year anniversary of the Mendeleev table this year, as it is the 500 years of the death of Leonardo da Vinci, my good friend. I am a pupil of Leonardo da Vinci.

So, Accelrys, bioscience, material science. Understanding from the molecule how you create new things, whether it's living tissues or new material science for additive layer manufacturing.

This is a serious platform, which is already integrated.

It was a core move for us.

Then in 2018 we delivered the Living Heart program, and many others that the team will talk to you about.

Now we are in '19, with Medidata.

So, what is the play here?

We have built a platform which is experience-based.

The beauty of experience is, when you see and experience, you understand things. You can capitalize on knowledge and know-how.

As Einstein said, the ultimate knowledge is experience. And I will add, the ultimate of know-how is through experience.

But in any world of virtual experience help people to understand the phenomenon. But more importantly, if it's presented to a group of people with multiple disciplines, they discover it in a different way.

And then the platform as a business model, you have heard about the marketplace, you have heard about how we want to do the Amazon of production for manufacturing, and it's moving toward that direction. So one click away, you can send a digital design and get the physical part. Those are things which are happening.

So, how do we do that?

We have invested massively in science, what we call "multidiscipline science." And that was for the fab world, the manufacturing world.

We are doing the same now for human.

And you will see a concrete example this morning about how is this being applied, Living Heart being one of them.

As you know, FDA love the Living Heart program because they think it's going to change the world of surgery, especially vascular surgery, and you will see a few things here. It's about dermatology, neurology, cardiology.

You see here the wide spectrum, and we use some of those science-based modeling and simulation to serve those things.

The interesting news -- it works. We have proof points that it works.

So, that's what we want to reveal.

Now, if I look on why we connected with Medidata, is the way I look at the life science world and the health care system today is they are far too expensive as compared to what is the outcome.

Those companies have been behaving like very rich companies.

It has happened before in other sectors of the industry, and we have seen how it could change quickly.

The way I would summarize it is the world has been based on small molecules, chemistry, in the Pharma.

Relatively simple complexity in the development, gigantic complexity when it's applied to a wide population.

But things are coming upside down, and this is the blockbuster story on all this.

You need to make money with one, because you lose so much money with so many that fail.

That's the model today. That's the way I see it, and I don't think I'm so negative.

If we are doing a plane this way, we would do a hundred planes, put them in the air and say, "This one is flying, I'm going to produce this one. All the other ones have dropped."

Of course, it doesn't work this way anymore.

But the point is this is shifting, with Biotech especially, on the coupling of equipment and biologics.

It's shifting to higher complexity in development for smaller targets of population, targeted population, to an extreme of individual personalize.

And those companies are not used to manage complexity up front.

They are used to manage the complexity or evaluate the result at the end, not the beginning.

So it's upside down, and the process for development, research, manufacturing will change in a big way.

That's my bet. I am taking it. If you are here, you will have to decide if you take it or not, but we are going to make it happen.

If I look at -- it's even worse when I look at the stupid patent process.

Of course, when you have a simple thing, you want to protect it because it's so simple. That's the reality.

But if you do very complex things, you don't even need to patent them. In fact, I recommend you don't patent them, because people will not be able to replicate them anyway.

So, things are changing from that standpoint.

On the patent thing, 20 years, if you take ten years to develop it and do the clinical trial, you have only ten years of life cycle, so it's really a race on the numbers.

Those are typical numbers for us, so we know how to work those companies, manipulating those kind of numbers, and I believe we can help them go and look at their world in a different way.

So, here is four things that I will briefly, before I conclude, tell you about. There are four focus in what we do.

On the north side is multidiscipline collaboration.

Making sure that all specialists of different disciplines, who don't talk to each other, don't understand each other, can finally understand each other with high clarity.

And you will see an illustration with Claire on the team, and Jason, on that topic.

That’s the collaborative process.

I’ve visited many companies, very large companies, in the life sciences sector. I am astonished with the poor environment they have for multidiscipline collaboration. It's document-based, they don't find a document they need when they need them, they are difficult to read, nobody reads them. It's very artisanal.

Then on the west side, of course, you have the representation of things and phenomenon.

When we started to say that we would be doing a digital airplane, every one of the top specialists said we will not succeed because it's far too complex. Aerodynamics is too complex.

The problem is not to be perfect. The problem is to reach a level where a group of people can imagine new solutions just because they see in front of them something which is not too far from the real phenomenon.

And that is the power of collaborative process. So, representation of the phenomenon.

And then, big data analytics. We are a big data company for 35 years.

I don't know if you have an idea about the volume of data generated by our clients.They're just gigantic. Gigantic volumes of data, including life cycle of the data they do for the products they do.

So, we know how to manage very gigantic, large data structure, highly complex and heterogeneous.

And it's not with documents. Its' with true representation, what we call modeling and simulation.

Then, on the south side, you have the confrontation between what you think is the representation of the phenomenon with the real phenomenon as it is observed.

Welcome to Medidata.

Because there is an arm we don't have, which is all the real data from clinical trial, and confronting this to the new representation of the world for life science is going to be exciting.

This is a video that represents all the process, briefly, as I'm going to conclude with timing just being -- before I give the floor to Tarek.

So, here is a real situation, cooperation we have on the Living Brain program.

This is the brain.

You see a cooperative environment, a collaborative environment going on, with all the specialists from the different disciplines.

We represent the brain at the level we can represent it. The professors are discussing about this. They are preparing the process by which they are going to put electrodes in the brain.

The problem with the brain is it's moving the head, so it's quite complex.

Then you connect this to a mass vault of data, the individual data profile.

Of course you plan this, you connect this with other diseases or other problems that might have happened before.

You basically take a system approach to what you are going to do on the human.

And we take, of course, scans.

We build automatically the 3D views, like in this case vascular with coronary flows reconstitution.

This can be done in a few minutes. Today, the cycle time for this job is several days.

I've heard about the start-up in Boston trying to do that, and maybe wanting to do an IPO. We need to do it faster, because I think our technology is far superior.

We can rebuild the vascular in a few minutes, and we have a very accurate flow in vascular.

This is the DNA connection with the other data, and we connect those elements together.

This is a real Corporation going on. In fact, the platform for Living Brain -- Patrick Johnson, director of research, stand up.

We started together the bio intelligence project.

We are doing that, and we are starting clinical trial of the virtual platform itself for the virtual brain right now as we speak.

So, you see the process here, so you can understand.

A few of you know how it works today based on documents and publications, based on big tables of data, on graphs.

This is a new world, because you have the world of collaboration, the world of passion journey, the world of modeling and simulation, and the world of real data coming from clinical trial users.

So welcome to the new core industry for Dassault Systemes.

That's a summary on why we are making this.

It has been well-prepared.

With that, Tarek, join me to tell us how great you have been doing things.

I am so pleased that you are here and that we are together.

>> Tarek: Me, too.

We are so excited to be part of the Dassault family. Thank you, Bernard and Pascal.

I'm Tarek Sherif, I'm Medidata's cofounder and co-CEO.

I think, just as I thought -- after ten years of being a public company I thought, "Okay, no more analyst presentations and investor presentations."

And then Bernard and Pascal pulled me right back in!

[Laughs]

But it really is a pleasure to be here and join with all of you today.

I'm going to give you a little bit of an overview of Medidata, and I think fill in some of the spaces that Bernard created in terms of talking about what was the rationale, and what is it about Medidata?

Who are we as an organization? And why we're so excited to be joining forces.

I think in order for us to get a sense as a company, it's important to understand our mission.

From day one, we cared about building great technology that would impact patients' lives.

That's something that underlies our entire culture of our business.

The people we attract, the customers that we work for, they all care deeply about impacting patients' lives.

And I think, in a small way, we've been able to do that.

I will walk you through a little bit of the history of the company.

What brought the two companies together was a shared vision, and that vision is that there is a big transformation that's happening in the world of life sciences,

in the world of the way therapies and drugs are discovered.

And we both, as organizations, have a passion for innovation.

We care deeply about impacting society, and when we saw that that vision that we have, that we could accelerate it together and make it more of a reality sooner, that convinced both sides that we should come together.

And I think that's what we are so excited about, because the words get used a lot these days.

I assume in this community you've heard of the idea of precision medicine.

Well, precision medicine means that you're targeting smaller and smaller groups of patients with highly-tailored therapies, ultimately getting to the individual as having a tailored therapy just for them.

The entire industry of life sciences is built around an entirely different model, and that model is around coming up with an idea, manufacturing it, and giving it to millions and millions of people.

And so the business model, the infrastructure, all the processes, are geared to mass distribution, not to the concept of precision medicine.

But the reality of the science, the kinds of improvements that we are starting to see with things like CAR T therapies are that when you do focus on small groups of patients with specific biomarkers, or even on an individual, the results are remarkable.

You start saving people's lives.

So, the transformation that we together want to enable – and I think as you hear more of the presentation and you get to know us a bit more as a combined organization, you will understand why we are best positioned to help that transformation to happen in life sciences.

Because it is going to happen, but it needs the kind of company that does so, along with Medidata and BIOVIA and all the other solutions that we have.

We need to come together in order to make that transformation a reality.

So just a little bit about Medidata: from the very beginning we were a cloud-based company, a subscription-based company. That's something we are bringing into the Dassault family.

To give you some stats on the business, currently we have about 5 million patients' worth of data. Now, those patients are some of the sickest people in the world. They have rare diseases, they have cancer, they have gone through clinical trials.

I will talk a bit later in the presentation about why that is so important.

We are about a 3000-person organization. We are global in nature.

Clinical trials are run around the world, and we have been the software infrastructure that has run clinical trials in over 140 countries around the world.

An interesting stat: in 2018, 13 of the top 15 revenue-generating drugs in the world had been developed on Medidata software.

So, we are a very key supplier to the life sciences industry.

To Pharma, to biotech, and device manufacturers.

In total, we have run about 19,000 trials -- I will give you a little bit of perspective on that later on -- and we have about 1400 customers.

That number has been growing fairly rapidly.

Just to give you a little sense of the business since we began, we started with a fairly simple idea back in 1999.

That idea was to harness the power of the Internet to take what was a very manual, slow process and bring the digital world to it.

What the core of our business was and continues to be is something called "electronic data capture."

It's the idea of bringing data in, using the Internet, helping to manage that data.

That was a paper-based process back in the '90s and before then when you were developing new drugs, in the clinical developing process.

So, the area of drug development that we focus on is when the work is done in the research lab and you begin to do testing on patients.

That is the clinical trial phase.

I will get a little deeper into that.

So, we saw an opportunity to take something that was a very manual process, very error-prone, very lengthy, and very expensive, and harness the power of the Internet and software to make it much more efficient.

Over time, we saw other areas in the clinical development process that were equally inefficient and manual, and we started to apply technology to those.

I'm not going to walk you through all the different solutions that we came up with, but I think you can see that, over time, we started to build out our footprint with our customers.

That's very important.

When Rouven walks you through our business model, you will understand why we have such great growth over 20 years and why we maintain sort of the strong customer relationships that we have today.

Over time, what that lead to was us developing a platform that you can view as the system of operations within life sciences.

On the left-hand side, what you will see is all the various inputs of data that are required when you’re running a clinical trial.

It may be data from the clinician who is running the trial; it may be sensor data, more increasingly, from patients today; it may be images, it may be genomic data, it may be consenting to being in a clinical trial or lab data.

All the things that are inputs to making a decision on whether you should move forward with developing a drug, or not.

On the right-hand side, you see some of the new data flows that are coming.

Maybe from EMRs, maybe from social media or claims data.

That's the kind of data you need to enrich the decision-making process in clinical development.

And, obviously, you need advanced analytics to make those decisions.

So, some of the strategic pillars of our business are to be that operating system at the core of the decision-making process for our customers.

So, we are the technology that they rely on, much like you would rely on the phone service for your communication.

We are the core infrastructure that Pharma companies and biotechs rely on, to help them manage the data and to make the decisions on whether they should move forward, and how to move forward with developing new drugs -- which, as you know, is critical to their successes.

It's obviously a very strategic role that we have.

We surround the technology that we develop with best-in-class services.

We live in a very domain-specific vertical where domain expertise is very, very important, and we have spent 20 years building the knowledge to be able to serve our customers effectively, because providing technology is not enough.

You have to make sure that you deliver the value based on the service that you deliver with that technology, and I think we have a very strong reputation for that.

When we win customers, we never lose them.

Our customer attrition rate, we used to report it publicly.

It was less than 1% -- much less than 1%.

So, our turnover in customers was less than 1% for most of the history of our business.

We are very sticky.

Part of that was delivering great technology, but part of it was the delivery itself.

It's the service people on the front line who our customers trust.

Increasingly, an aspect of drug development that I think is a little bit less appreciated by broader audiences is that the patients are getting much more involved in drug development.

They are inputs into the development process now.

They wear sensors, they provide objective data back through diaries that they fill out.

There is more data that allows you to make qualitative decisions, but that are objective, about how efficacious a drug is.

That becomes more and more important as you are targeting patients in smaller populations.

You are going to hear a lot about this throughout the presentation.

I think -- obviously, we're in a data business.

As Bernard pointed out, it may be drug development and the entire process hasn't been as efficient as it should have been.

Well, for a process that should be based on data, the analytics have not been very advanced in our industry.

And that is something that is changing right now.

The advent of artificial intelligence, much more rich data sources, that is bringing about a Renaissance in how people think about drug discovery and drug development.

I think we are at a very interesting time, coming together to enable more of that to happen.

I would say that, in terms of thinking about the life sciences industry overall, it's probably one of the best times in a century to be in the drug development business, and so it's also a great time to be in the business of providing technology to the companies that are developing these drugs.

So, obviously it is a huge market, right?

$1.2 trillion or more gets spent on therapies and drugs, and that number has growing very rapidly.

The process of developing drugs is about $100 billion business, plus.

One of the interesting facts about that is technology plays a very small role right now.

I think I saw a statistic a couple of years ago, actually, that said behind the U.S. government, Pharma was the least advanced in adopting cloud technology.

All other industries were further along.

And yet, they spend so much money on developing drugs, and there are a lot of compounds that are in development.

16,000 different drugs that are currently being developed.

When you look at -- we will go into some of the issues in a minute -- when you look at the number of drugs that actually come to market in a given year, the FDA approves something under 100 drugs a year.

Think about that -- 16,000 drugs being developed, but in any given year, in a good year, it's 100 drugs that are making it to market.

And that tells you something about some of the inefficiencies and the problems involved in the drug development process.

Before I go into that, I do want to reiterate something: Pharma R&D has very long-cycle innovation waves.

We came off of one in the 2000s, where there had been a series of blockbusters that came out in the '90s.

They drove growth for the Pharma industry, and then that cycle ended.

There wasn't as much innovation, there was much more focus on cutting costs, on M&A, bringing the industry together and consolidating.

Over the last five years, the next wave of innovation has started.

These tend to be 10, 15, 20-year cycles.

You’re starting to see a lot of innovation coming out of the life sciences industry.

That innovation is very good for patients, but it also means there is a lot of opportunity for companies that can help Pharma companies transform.

That's what we get so excited about.

So there is a very, very long opportunity that is starting to open up in front of us.

Let's look at some of the stats.

So, you have a one in ten chance of having your drug that you went through multiple years bringing through research to get to a phase one study.

There are three phases you go through before you can commercialize a drug, typically.

Sometimes it's a bit more than that, but just to leave it very simple.

You have one in ten chance of getting it right, and getting this drug to market.

As Bernard said, could you imagine if you designed a plane and you have like a 10% chance that it's going to fly?

Those are not good odds.

They spend a lot of money to bring a drug to market.

$2.6 billion is not sustainable, because while it's not as much as in airplane program, there are people who run a lot of these programs.

So there's a lot of money going into the development process.

But if you're targeting smaller and smaller groups of patients, it means the revenue on the other side is going to be smaller.

If you develop a blockbuster and you can sell it to millions of patients and it drives $10 billion of revenue, well, then a $2.5 billion investment at the front end is easy.

But if you know that the maximum revenue you are ever going to get, because it's a small group of patients you've targeted that have the right biomarker profile, maybe you can only spend $250 million or $400 million.

The industry is not currently equipped to spend less on smaller, targeted groups.

[Indiscernible]

Regulations have gone up, and I think that's been a good thing for the most part, because it means we are bringing safer drugs to market.

I think one of the other G&Awing or difficult facts is that, even when you get your drug right, even if you've gotten all -- you've managed the risk, you gotten it to market in a timely way -- only half the drugs that come to market ever achieve the revenue potential that was forecast for them.

There are a myriad of reasons having to do with reimbursement, having to do with marketing, et cetera, that may cause that.

So, overall ,what you are hearing is it’s an industry that is, as Bernard likes to say, very wealthy.

It’s cashflow-rich.

It drives a lot of revenues, it drives a lot of profitability.

But it has some systemic problems, especially in an era where the underlying science is shifting in a way that they have to transform.

To us, that means nothing but great opportunity, and the opportunity comes in a couple of different ways.

Our value prop, both singular as Medidata as a standalone company and now together with Dassault, it's actually pretty easy.

The first one is we are going to improve productivity.

So that means we are going to help you to get your drugs to market faster, we are going to help you to do it at a lower cost, which obviously you have to be able to do.

We are going to help you maximize your ROI.

You get the return, you get your drugs to market faster.

I think one of the other things that we have as a value proposition is using data in a meaningful way to help you make better decisions.

To reduce the overall risk when you are bringing a drug to market or when you are bringing a drug out of research into the development process.

Ultimately, we want to improve outcomes.

We want to make sure that the right drug goes to the right patient at the right time.

A couple of things about Medidata specifically that make us unique is I mentioned earlier that we have 5 million patients' worth of data.

That data is incredibly valuable.

About a decade ago, we started to ask our customers for the right to use their data on an anonymized basis.

Both their operational data and their scientific data.

It’s an amount of data that cannot be easily replicated by anyone else on the globe.

We have data that is global in nature.

It comes from every therapeutic area.

It’s cross-industry.

Most importantly, it is very rich and deep.

So, we know everything about a patient in a clinical trial, for the period they are in the clinical trial.

We know every measurement.

You can use that data to drive real, meaningful insights.

Again, I won’t go through all of these, but you can help to demonstrate the value of a therapy you have in development by comparing it to the standard of care.

You can make better decisions about where to target, which doctors to target, or which patients to target in your clinical development process, which means that you’ll be able to get your clinical trial up and running faster and done faster.

The leading cause for delay in clinical trials and higher costs is that you can't accrue enough patients.

We can help you make better decisions about where to find patients.

We can help you make better decisions about whether you should proceed with your drug development process or not, and we can help you to explain to regulators and to the payer community, and to the providers, why your drug that’s in development currently is better than the standard of care or anything else out there.

And those are very valuable insights that our customers have never been able to get before anywhere else, and they can get them from Medidata today.

So, I’m going to ask Rouven Bergmann to come up for a minute, and just spend some time explaining our business model to you.

>> Rouven: Thank you, Tarek.

Good morning, everybody, from my side.

You saw Tarek talking about our strategic pillars, what differentiates us as a company.

What I would like to spend some time on is to explain to you what are our strategic components of our business model. How does Medidata actually work?

So, one of the really important concepts we have is the land and expand model, and that's built for long-term and durable growth.

There are five vectors, what I would call it, that are very important to understand about our business.

The first one, it's always good to start with customers.

You heard about the 1400 clients that we have; when we started 20 years ago we started with the first one, and over time you saw the chart that Tarek showed where the curve was going -- there's an acceleration of customer growth in the last two to three years.

What's important with this customer base is that it captures all segments of the market.

So we have customers in the top segment, the largest Pharma companies in the world that run the most complex portfolios of clinical trials, across many therapeutic areas. Med devices, Pharma, everything together under one roof.

But also we are able to cover the biotechs, the companies that just started and have one or two trials.

What's really important to understand is that we serve this market with the same standard solutions, so our cloud scales across this vector.

They are not different sets of Medidata versions that these companies are using. No, they are starting with that system and they are scaling the growth with our platform over time.

That's very important to understand.

The ecosystem, we say here ten of the top ten CROs. Very important, because those clinical research organizations, they give us access to our biotech market. They serve the industries and operationally run clinical trials.

It's very important to work with them and enable them to be more efficient, and for us it's also a very efficient way to get to market, and addressing the biotech firms without having to have a direct sales force that covers all these small companies.

The second vector, revenue retention, Tarek talked about the revenue retention and the record levels of revenue retention that we've been enjoying.

Really, what I think is important for you to take away from today is that, when we have a customer, the customer stays with us. That is reflective in the numbers.

Even if we have a customer, we have a track record of expanding our relationships with these clients.

So, on average, over the last two years, we've been able to expand revenue when we renew with the customer, that revenue commitment, on an annual basis.

On an annual basis, like for like, over 25%.

So, going through a renewal cycle is for us a source of growth, because we can work with our clients to expand our share of what our relationships, our product is very sticky, and you saw also the journey of innovation that we have.

So, we have multiple products that we can offer as part of a renewal cycle.

Long-term relationships. Typically, our subscription contracts have a duration of two to five years, and then we renew our contracts.

That gives us a lot of visibility in terms of our revenue model, and they expand with us over time.

One point that I don't want to lose mentioning is the differentiated service offerings that we have, which is very important not just from an implementation perspective, but these customers stay with us to have ongoing support services that they buy from us. They really rely on our capabilities to help transform the clinical data management and operations.

Revenue mix. Something we are very proud of: we've been, over time, able to build a very stable model.

About 85% of our revenue is cloud subscription-based, with the highest subscription growth margin. And 15% is services revenue, of which about half of it is recurring support services.

Also for those types of offerings we have very good visibility, because they go terminus with our subscription revenue.

The last point, I think very important and a source of our success, we as Medidata team are very proud of it, is our pricing model. Because the way we've designed it, it's transactional, consumption-based.

Essentially what this resides in, as our customers are growing and are running more trials, we are able to grow our business and our revenue because of how we price our service offerings,

our product offerings, it's based on the number of trials that they have a subscription to use our platform for, as well as number of patients they can enroll. Or, the number of sites they actually enable to enroll patients.

So, it's very granular defined, and it gives an ability – as we grow our ecosystem, we grow our revenue.

I think that's five very important points to understand.

When you put those five vectors into action, what does it reside in?

First, we are growing our customer base. You see that in 2013 to today, it's 3.5 times acceleration and number of customers. Today Medidata is the standard, the gold standard, in life sciences for clinical development. Most of the companies are using us across the world. That is what's reflected here in the number.

But the other important point is, when we have a customer, we are very focused on expanding our relationship with these clients.

You see here on the left side, this cohort slide, which is three segments that we chose – that we kind of want to demonstrate that to you.

The green one, which is the biggest one, these are customers that we have acquired prior to our IPO.

When you look at the revenue we generated with them in 2013, a dollar in 2013 equals about $2 in 2019.

So we've doubled that revenue with these clients over time, and it comes because they are using more of our products, but they're also running more trials.

We have done the same thing with clients that we acquired between the IPO in 2013, and for those who joined us from 2014 onwards, we are now 3.5 times up.

Every time we have a customer, we are able to expand relationships and grow our business.

I think that's very important to take away, as well.

So, how do we actually execute this land and expand strategy? Our opportunity to grow within our customer base.

Bernard talked about the framework that Dassault Systemes has built to grow.

That is kind of our framework on how we've designed our business and our growth strategy, is to start sometimes small with our customers. Typically they start with core data capture, the core data capture platform.

Over time, as we are innovating and investing and make it more seamless to work and expand into the platform, we have an opportunity to attach more product.

Attaching more product gives us an uplift of 2 to 5 times over time.

Then, when we get our customers to the next level, we really are embarking into a transformation journey through data science analytics and our unique assets that Tarek walked you through.

Then we have an ability to go even above that five level. We have a number of customers we have done this, and I think when you later listen to the panel, Glen and the team will show you how this has worked for some of our customers and how successful we've been able to put this strategy into action.

With that, I hand it back over to Tarek.

Thank you so much.

>> Tarek: So, I think the big take away here is we have an industry that is in the midst or in the beginning of a transformation. by coming together, I think we can both drive that transformation but also create an enormous growth opportunity for our combined organizations.

Because once we're in an account, we tend to grow our revenue profile within that account.

I think the various solutions that Dassault brings to the table, as well as those that we'll be developing over time together, give us an opportunity to really transform our customers, create a lot of value, but also generate a lot of growth for our combined businesses.

I just want to take a second on our culture, because I think it's so essential to understand a bit more about Medidata.

The alignment between Dassault Systemes and Medidata has been so strong. I think in the year of getting to know each other and in now starting to work together, we feel really good about where we are together.

Because, as you know, you can have deals or acquisitions that make a lot of sense strategically in one way or another, but the thing that has to align for it to work is the culture.

There has to be that shared passion, and I think we see that. You know, our folks could not be more excited to be part of the Dassault family. The way we've been welcomed in as an organization has really been amazing.

Corporate social responsibility, very important at Medidata, as it is at Dassault Systemes.

We've both done a lot of things proactively internally, and we've gotten external validation around that.

One other thing that is quite important: we work in a highly regulated industry, as does Dassault Systemes, at least some of the industries they are focused on.

We have put a lot of time and investment and thought into making sure that we meet all the data privacy requirements.

That we have data that's secure, at least as secure as it can be in today's environment.

That's important to our customers. It's something else that they focus on.

And then I want to leave you with just a thought here, which is that -- I talked a lot about the opportunity, but there's also a purpose behind it.

I think we share this caring for having an impact on society, having a broad impact.

As we come together we can transform an industry, but I think over the longer term what we really want to do is impact the entire society by how we interact with the overall health care ecosystem.

And that is very, very exciting, I have to say.

With that, I think we are going to open it up to Q&A.

Is that right?

We will ask Bernard and Pascal --

François-José>> We'll ask Pascal, Bernard, Rouven to join us on the stage.

I am seeing the first question.

>>

It's Mohammed Moawalla, Goldman Sachs.

A couple of questions.

First, just for Tarek and Rouven on Medidata, can you just clarify up front, in terms of the data that you hold, who owns it, what are the security arrangements you have in place?

Is that all fully in the cloud, or is some of it set on premise?

>> Tarek: So, our customers, our end customers, Pharma own the data. As do the sites, obviously. The ones who generated it.

We have secondary use rights to it.

We anonymize the data. We do hold it in the cloud, but as I said, we take a lot of precautions around the security.

Clinical data is a little bit different from the data that you typically see around consumers, in the sense that it starts off in a deidentified way.

Because most of that data, when you enroll a patient into a trial, they become a unique identifier rather than having the phone number and the patient name, et cetera.

So it's got multiple layers of deidentification in it.

There are some use cases where we are collecting data directly from patients now, but obviously we are very sensitive to all the various privacy requirements around that, and the consents that are required.

But in a typical clinical trial, you get consent from the patient right up front to use their data.

>> Okay.

Secondly, you talked a lot about how much money the Pharma industry is spending on drug development, yet also how extremely inefficient it is.

It sort of reminds me about banks and their spending on I.T.

Can you give us a sense of what the I.T. spend is among the Pharma and biotech companies, as a percentage of your budget, if you know that?

And as we think about that shift, is that going to grow in absolute terms?

Within that, are there any specific shares of wallet that you're sort of targeting both independently but now at Dassault?

>> Tarek: Absolutely.

I'm going to get a little bit on thin ice, because the numbers are hard to come by, but mid-single digits is historically the number that's been thrown around for I.T. related to clinical development.

That number is absolutely going up.

So, cloud adoption is starting to pick up, and that plays directly into our hands.

The focus on AI and how you can get more value from the data, that's one of the areas where really I think the industry has a lot of opportunity going forward.

Because the data was historically used just from the perspective of, "Let's run statistical analysis on it." Right? But not using the rich data, and not looking for deeper insights. That's something that is changing.

It's slow right now, but I think it's going to pick up the pace.

So the opportunity for us is to turn that spend that is in the mid-single digits into a double-digit spend.

Obviously, that's a huge opportunity.

But I'll leave it -- also, if you want to add on anything.

>> Pascal: No, I think when we have developed the plan, the bet is exactly what you said.

Today, it's an average of 4% to 5% of spend in the I.T., relative to the total spending, and the goal is at least to reach 10% in the next five years.

This market is really underpenetrated, and you will see in my presentation that it's highly fragmented with many niche players.

So, just because the offer is not well-structured, there is limits right now of what you can do.

>> Last one for Bernard, as we think about the platform you're looking to build here, you've obviously got now the data, you've got a lot of the kind of tools within Dassault.

Obviously, Veeva, you talk about analytics, and Veeva is sort of closely aligned with Salesforce.

You've also made some analytic acquisitions.

Is there something you need to further augment in terms of analytic capabilities? Or do you think you have that sort of end-to-end platform complete now?

>> Bernard: I think we saw with our recent discussion, especially with Glen here, I think we found out that the Medidata is incredibly powerful data science with Acorn. A great presentation yesterday with customers.

If you add what is in Medidata, and what we have on the front end side, I believe that we can quickly show the difference as compared to everything that exists today in the industry.

We need to showcase and connect, but I think this should be a very big differentiator.

Related to the competitive landscape, you know -- I will do a lot of analogy with the competitor you mentioned. Some of our past competitors in the other sectors, if I may.

It's very thin. We are very deep.

I don't think documents will win.

>> Hi. As you bring the two companies together, would you envision, as the processes, products, systems, and approach come together, that you would be sharing with us over the coming years the types of long-term partnerships that you have announced an aerospace? Whether it's with Airbus, or mining with EHP, in the life sciences sector?

And in your initial strategic thinking, can you sort of share with us what you think that opportunity looks like above and beyond the clients that you already have, independently and together, as the company becomes one?

Thank you.

>> Bernard: I think there is, if I give you some inputs into the way I see the decision process evolving, in these industries.

First, a few years ago when we initiated contacts thanks to BIOVIA, to Accelrys and BIOVIA, we discovered that in these kind of companies the decisions are taken at a relatively low level.

At least when it comes to the R, D, or manufacturing. Not speaking for clinical trial, but for the side that we know.

This is elevating now.

When we meet now with those companies, the CEO wants to be involved. It’s not long ago, and they want to understand. So they are trying to better understand their transformation road map.

It happened the same way in the other industries we've been serving that you just referred to.

Of course, this is a very critical factor. Who owns the decision process?

Because fragmentation in what they have today is based on the fact that they have left the decisions to the specialists.

The specialists don't care about what the other guys are doing. They just want their nice toolkit for what they do.

And this is why the process is broken. There is no digital continuity in those companies. Almost zero.

Now, they talk about the data leak just thinking that putting things in a big tank will solve the problem.

It does not. It does not solve the problem, because if the data don't understand each other, you do not have the proper segment -- you have a connection of data and you can't do anything with it.

In short, yes, we see the evolution of ownership of the decision-makers. And I think this is a condition for those long-term, big contracts to be set up. I'm convinced that it's going to happen. Too early to tell you how fast.

I'm getting an insider experience from something else I'm doing as a board member of a Pharma company. So I'm seeing it from the inside, which is an eye-opener for me, as being a member of the board of Sanofi.

And I think that things will work from that standpoint.

>> Tarek: If I may add on, Bernard, I think what we're starting to see is that the CEOs of some of the Pharma – this isn't that broad yet -- and the boards are basically charging someone in the organization with thinking about building a strategy around digital transformation.

How long that takes and how quickly it's adopted is a different question, but the conversation has been elevated to the board level.

There are organizations that are being more aggressive. Some are being less aggressive.

But it is a conversation that's happening at that level now, whereas in the past the decision-making had always been much lower. Head of clinical management, maybe, deciding which vendor to use for their infrastructure.

Now that's being elevated. Because these are major transformational programs.

>> Thank you, good morning.

A structural question and a practical question for Bernard and everyone else.

The practical question is, have you developed the product integration road map? Can you talk about some of those details?

Just at the core software architectural level in terms of taking, let's say, DNA from BIOVIA or SIMULIA or even the manufacturing side of the company, and integrating that in some time frame that you can talk about with Medidata.

The structural question is, Bernard, you have talked for years that one of your highest priorities is increasing the number of DS users. You are getting a good customer base, of course, with Medidata. But the number of customers, as it was with Accelrys, is not particularly large, although they have grown it.

So, how do you think about the growth dynamics or vectors in the context of a fairly concentrated and relatively small number of customers to drive revenues from the acquisition?

>> Bernard: Well, I think later on there will be a discussion.

Glen will be well-positioned to tell you how much he fell in love with the 3DEXPERIENCE platform.

I think that Medidata has a very powerful platform for clinical trials. It is very well-done, cloud-based, good technology.

We have the front end platform from R, D, and also manufacturing.

One lab from the BIOVIA is being extremely well-architected now on the platform. Jason will show that this morning.

So I think it’s going to be relatively easy to connect, because it is not a rewrite of the code. It's a connection of two great platforms.

On the number of customers -- you know, I think it's related to the previous questions. Who owns the decision in those companies?

The reality today, it's a very fragmented set of systems they have. Very disciplined, fragmented.

We saw that 30 years ago in other industries, and there are so many limits with that.

So, I think our responsibility is to showcase that the transformation can happen. It’s now, it's possible. And the niche players should be replaced by a consistent digital pipeline for the industry.

So it's up to us to work with customers to do that, but I think --

>> Pascal: Maybe I should add a few numbers, because I'm not in agreement with what you said.

You have close to 5,000 Pharma, today only 1,400 have been served by Medidata, almost 800 by BIOVIA, and we have an overlap of about 600. You still have most of half to be conquered. That's point number one.

Every year you have almost 1,000 startup come in, with active molecules. They are active pipelines. Those guys are coming on a regular basis.

If you look at the medical devices, we are talking about 50,000

ustomers. Today we are reaching 10,000.

Not taking into account the hospitals, the practitioners, those are the supply chains want to connect with the platform.

So coming back to your question, I think if you look at the footprint of this sector, it's as large as the industry is today.

>>

Stefan Slowinski from Exane BNP Paribas.

A question for Tarek, kind of along the similar lines of the last couple of questions on customers.

You talked about the land and expand strategy. You have 12 of the largest 17 Pharma companies.

I guess if you focus on the five you don't have, why do you think you haven't been able to win them as customers? What do you think it will take to penetrate those accounts?

Also, just wondering if you have any kind of initial feedback from your clients and customers on the acquisition by Dassault Systemes.

>> Tarek: Let me start with the last question first, and I will get to the other two.

The response has been incredibly enthusiastic and positive. A lot of our customers know Dassault Systemes, they trust them and they value their software. They are really happy with us coming together.

In fact it's kind of been an interesting challenge because they are like, "Okay, when are we going to see the fruits of this?" They want to get going. They want to see everything come together, because I think their view of how the industry needs to transform aligns with our view. They just want to get going with that. It has really been universally positive, and that is gratifying. It means we were right when we made this decision.

I just want to add something as it relates to revenues, by the way, to what Pascal was saying.

Which is our model has always been -- yes, it's important to add new customers, but the stickiness with the customer and driving increased revenue is how the model has been so successful for us.

I would say, in any given year, 80% of our revenue, 85% of our revenue increase comes from our existing customer base.

If you are talking about the kinds of numbers that are out there in terms of new customers that we can acquire, and the stickiness that we have with no turnover in customers, negligible turnover, and now a second – you know, a larger solution set that we can sell into them.

That doesn't even account for the things we are going to be developing.

I suppose I wouldn't be here if I wasn't as enthusiastic -- I can't even speak anymore, I got too excited -- about the idea of what we can do together.

>> Pascal: And the low I.T. spend today.

>> Tarek, Yeah, and the low I.T. spend.

As it relates to the specific customers – [LAUGHS] I've probably spent a decade answering this question.

We have, over time, added more and more of the top 25 Pharma to our list of customers.

We're going to get them over time.

Some are slow to move. Change is very difficult at Pharma, especially when technology is built into a process. It can take years to make that decision.

It works. It's a double-edged sword. When you are the incumbent vendor it's very difficult to displace you, even if the newcomer has great technology, because you have so much process built around it.

Change management is so difficult, so expensive, and takes so long.

And it's in a risky part of their business, because if you get the clinical development wrong, you're talking about the future revenue generation.

We always point this out.

But we are almost a billion dollar revenue company. I will give us some credit.

And we were running probably what the future of a trillion dollars of software, of drug development, on our software and in our database.

You are core to their future, so they are very slow to change you.

I think we have the best technology in the industry.

I think we have the best services folks in the industry, and domain knowledge, and we are innovating like hell and we are going to be moving even faster.

I think over time those organizations are going to come to us. Some of it is entrenchment, any number of things.

I'm not saying we're perfect. I'm sure there are places where we could have done a better job of selling into them.But some of the customers that we have acquired in the last few years, like Bristol-Myers and Novartis, Novartis took us a decade to have them move.

But once they move, they stay with you for decades. So it's worth taking the – you know, it's a long sales cycle, but it's worth it.

>>

Stacy Pollard with JPMorgan.

So, Bernard has provided a vision in life sciences.

Tarek, I would like to ask you -- in terms of synergy with Dassault in the life sciences business, what do you think some of the best opportunities are for your business intermingling with Dassault?

Perhaps some specific examples of what you think you'd be doing, which technologies could come together.

And I know, of course, on the technology side you've got Dassault's data platform, you've got perhaps OUTSCALE as an opportunity.

But I'm more interested in the science-specific examples.

>> Tarek: Can I ask you to hold that question until we do the second part of our presentation?

>> Was that going to come up in the next segment?

>> Tarek: We can help you with it visually, too. We'll give you a more in-depth answer than I can give you in a short period of time.

What I would say is that what Dassault Systemes has today and the direction they are moving is so complementary to the direction the industry overall is moving.

Right now, research is siloed from development, which is siloed from commercialization.

Those silos are starting to break down. Not because of some great epiphany, but because the economics of what regulators and what the providers -- and because of the payers, they are pushing Pharma to change the way they develop drugs and even conceptualize drugs.

That is all going upstream, all the way up to research.

And that's where that combination of knowledge -- researchers right now typically don't get any feedback on what's happened in the development process, and even less so what happened in the commercialization process.

If we can bring sort of this disjointed data back to the researchers, you're going to get a feedback loop that produces much better drugs.

Which, again, will reduce sort of the timelines they have for getting drugs out. It'll improve the efficiency.

But we will talk a little bit more about that in the next presentation in a few minutes.

>> François-José : We'll take one last question for this session.

>>

I was wondering if you can comment on trends in vendor consolidation in the clinical trials I.T. space, as well as do you foresee major share shifts given some of your key competitors wanting to gain share voice with some of the clients you have?

>> Tarek: Sorry, I didn't catch the first part of the question.

>> Vendor consolidation, you mentioned --

>> Tarek: Vendor consolidation?

>> Yeah.

>> Tarek: Yeah, so, that's an interesting one.

There is some consolidation.

We were doing some smaller acquisitions around the core of our space, just to bring some additional technology.

Roll-up strategy does not work well in our industry. We have always stayed away from it, and I think what you see is that for the most part it doesn't happen, because clinical trials are very discrete units.

Unless something is going terribly wrong, nobody wants to move from one technology to another in the middle of a clinical trial. It's just a disaster to try to do.

We've actually been given some trials because using other technologies has been such a disaster. It's not easy to do.

We are, as Rouven mentioned, we are the standard in the industry. We run more than 50% of all clinical trials.

There are some competitors that have tried to come into the space with very, very limited success.

On the periphery, if you are doing things like document management, it's a process. It's a lot easier to do.

If you are dealing with core clinical data, market share displacement or gains are very difficult to come at.

I think we're a provider that is viewed with a high level of integrity, a high level of innovation, good services organization.

Very few of our customers are unsatisfied with us.

I mean, if you walk around the halls outside, we've got a thousand people basically talking about how excited they are to use us and to see the innovation that comes out of it.

I don't see major market share shifts happening.

I think we are going to continue to be very aggressive. We've been taking market share since we started the business. I don't see anything changing in that regard.

>> Rouven : Maybe one aspect – actually, the need for simplification and consolidation also has been a catalyst where I.T. departments look to really consolidate and look for partners who can cover the process end to end, and really have the vision to move into the future.

That is why they come to us.

So we have examples where we have customers that have moved to our platform, they were able to get from over 40 disparate systems to below 20 and further down.

They did this because we were their partner.

So that is something -- of course, that's part of our strategy.

Simplification, consolidation, take it all on.

>> François-José : I propose a very short break.

10 minutes.

If you can be back at 10:30 sharp, that will be fantastic.

>> Bernard : One comment.

If you know Pascal, he cannot smile. Seriously, he got in an accident two days ago, so I speak for him.

We suspect a competitor wanted to clap the door on his -- we cannot find the competitor yet.

So if he is not smiling, it's because he has ten stitches on his lips.

Are you okay?

>> Pascal: I'm okay, I'm okay.

>> Very good. So, just for you to know.

>> Pascal: This is making me smile, which hurts.

>> Claire: I will share the stage with Glen de Vries, who is the Medidata co-CEO and cofounder, and Jason Benedict, who is the vice president for BIOVIA R&D.

I am Claire Biot, vice president for Life Sciences Industry, and we are thrilled to be with you today to present Medidata combined with Dassault Systemes joint value proposition.

As you've heard from Bernard earlier today, we have the belief at Dassault Systemes which is that the virtual world extends and improves the real world.

Of course we will still need real therapeutics to treat real patients, but we are convinced that these therapeutics can be optimized thanks to the virtual world, thanks to modeling and simulation.

Now, as many of you know already, and Bernard covered that earlier today, it is a major challenge to develop a new drug.

Moving from early-stage discovery all the way to commercialization.

It can take an average of ten years, $2.6 billion.

It is a major challenge for life sciences companies to accelerate time to market.

Why?

Because they want to address patient unmet needs faster, and they also want to increase the duration of market exclusivity.

In the past, of course there is a scientific challenge moving from hundreds of thousands of compounds to a single substance.

But also, once this substance is discovered, you want to validate it and becomes a challenge if you want to move toward precision medicine.

What are the right populations you want to treat?

Which clinical trials should you run?

Also, after that, you want to manufacture these products in several forms, dosages, packagings, depending on the marketed countries.

Obviously there is a massive challenge in terms of science, but there is also one of managing complexity.

Now, if you look at the top 20 companies on your reports and industry analysts' assessments, what are the internal and external forces that drive the need for change in life sciences companies?

Well, I have identified five of them that it will briefly describe now.

The first one is personalized health.

What we mean by that is that life sciences companies aim at developing a holistic approach to care, leveraging human data, genomics, but also behavior and the environment together with technological breakthroughs such as IoT AI to achieve precision medicine.

Tarek already covered that, but it's something I will insist a little bit more.

This is not about developing a different treatment for each and every individual, but here it's about considering individual differences over the course of prevention, diagnosis, and treatment.

The second challenge is knowledge capitalization.

This is a need for transformation that we know well at Dassault Systemes because it is well-shared across industries.

Now, importantly, over the past decade, life sciences companies have grown a lot by merger and acquisition, and you have witnessed that happen.

As a result, they are often divided into numerous isolated divisions.

To manage this, most of the companies have organized complex matrix-based organizations to enhance communication and the types change, but much, much more is required.

Knowledge capitalization is requiring connecting people, systems, and data in a virtual ecosystem across the entire innovation continuum.

The first need for change is total equality.

Here it's about ensuring quality and achieving regulatory compliance.

The goal is to create a compliance framework for innovation, ensuring that you embed quality and regulatory best practices early in the development cycle and end-to-end trustability of the product throughout its life cycle.

The fourth need for transformation is to achieve development and manufacturing excellence.

Here, why is that important?

Well, if you want to move towards personalized products and if you want to drive the cost down, you want to have adaptive and predictive development and manufacturing.

What does mean for clinical trials?

Well, you want to have smart clinical trial design, and you want to have agility in the way you run clinical operations.

And then moving down to manufacturing, the companies want to leverage the technologies coming from what we call industry renaissance, to be able to manage production processes in real time while continuous scale-up and tech transfer should ensure that the product is manufactured as it has been designed and as registered.

And the fifth need for transformation is about reinventing the value chain.

As Tarek already mentioned, life sciences companies have understood that they need to shift their focus from the product to the patient, and to the outcome for the patient.

They have to move away from the one-size-fits-all approach to supply chain.

Therefore, they are seeking to demonstrate value to payers, to regulators, to patients, to physicians.

That pushes them to reinvent their business models and has an impact on the entire value chain.

Now, as a consequence of this need for change, we are convinced that the next frontier in drug development is about transforming the patient experience.

So, what is our joint value proposition to meet these challenges?

Well, joining forces allows us to create the first end-to-end scientific and business platform going from early research and discovery all the way to commercialization, including for clinical development, clinical testing, and manufacturing.

Jason and Glen are going to take you along all of these stages and highlight our game-changing values and synergies along the innovation continuum.

But if I summarize briefly, in research and discovery, we unify predictive science and experimental results to accelerate the innovation and design.

With one lab, we transform laboratory compliance, efficiency, and collaboration.

In the field of clinical testing, we come with a broad range of solutions encompassing data management operations to accelerate value, reduce risk, and optimize patient outcome.

With License to Cure, we connect quality across the value Pharma enterprise and provide a data-driven approach to regulatory processes.

With Made to Cure, we help organizations reimagine engineering operations and planning to achieve manufacturing excellence with a special focus on biological processes.

And within the field of commercialization, we help our customers demonstrate real-world value to payers, regulators, patients, and physicians.

Now, before turning to Jason, let me make an important point.

We are convinced that Medidata's core assets and patient data, you have heard a little bit about that already.

Coming from clinical trials, but also real-world evidence and advanced analytics, strongly combined with the power of modeling and simulation, to catalyze the next generation of patient-inclusive therapeutics.

That is a perfect illustration of our belief, which is that the virtual world can extend and improve the real world.

With that, let me turn to Jason, who is going to take you through the innovation continuum.

>> Jason: Thank you, Claire.

I'm going to start with a little demonstration of some of the capabilities in Designed to Cure.

All of our industry solution experiences in life science, we refer to them as V + R -- virtual plus real.

This complements the virtual world extending the real world.

We start by characterizing what we want to do in our drug discovery program.

We refer to that as a target product profile.

From there, we are able to structure the drug discovery and development process, ask questions along the continuum, look at analytics, and take decisions.

You can do this through the 3DEXPERIENCE platform in a social context, also using the ideation funnel here, for example, to exchange with your colleagues.

So not only is it social, but there is deep science here.

This is not a thin platform, but a very deep scientific platform that adds social on top of the science.

This helps us break down the traditional barriers where scientists hoard their information to themselves.

We can take that information and publish it into a knowledge graph.

We heard about knowledge graphs earlier.

This is a knowledge graph for biological research data, bringing together multiple omics disciplines into a solution that we call the “Living Map.”

On the Living Map, it's not just a knowledge model.

You can simulate.

With that simulation, we can find new drug targets, or multiple targets for a drug candidate, helping us improve how we target a therapeutic for a patient population.

Once we have that target, in the 3DEXPERIENCE platform we are able to exploit multiple modalities of drug design and development, from small molecule to biologics, and now with emerging technologies and immunotherapies, cellular therapies, CAR T therapies.

All of those modalities can be addressed, connected, and designed.

We use the word "design" very purposefully here, because we are making this an intentional design process.

All of that knowledge, all of that capability and know-how can be expressed through the 3D experience platform here.

In a common data model, in a common user experience that combines this together.

At its best, we are able to combine the power of modeling and simulation and knowledge-based models expressed here through our AI-based drug design and development capability.

What you see here is a solution we call generative therapeutics design.

Our first target is small molecule and organize that down to multiple modalities, as well.

With that, you see multiple modalities are coming out of research.

This is putting a lot of pressure on the drug development organization to change their game, too.

All of the value that you see here are derived from real value engagements with our customers.

We are looking to shave years off of the drug design and development processes.

We are looking to help target the right therapy at the right target and increase the time to market so that we can cure patients faster.

Now, picking that up in drug development, this is an area that is undergoing a lot of digital transformation right now, and the potential gains are huge.

I'm going to take you on a small tour of our One Lab industry solution experience.

The first thing is we start to see a decomposition of the traditional barriers between discovery and development.

This has to happen, because of the new modalities that are emerging.

With solutions that we have here like scientific intelligence, we are able to connect the dots.

This is not a simple search engine.

This is a knowledge-based data lake solution with a specific scientific capability built in, searching the chemistry, searching the biology, aware of the biology, and able to connect the dots from all that information that we created in discovery and now also in development.

We need to develop procedures.

We need to develop the drug process.

With One Lab industry solution experience, we've been able to replace multiple disparate solutions.

This comes back to the N -1 question.

Do we see a consolidation?

Yes.

We need to have a consolidation, because the knowledge is in too many disparate systems.

We see multiple ELNs, multiple LIMS systems, and we are able to replace those with One Lab.

One Lab is not just a replacement for these systems -- it's better.

It's fully digital.

The methods and the drug development process we are designing here are supported by an ISA-88, ISA-95 structure.

That eliminates the technology transfer between the different silos.

What we are starting to see is our customers are adopting One Lab not only in process development, but also in quality control and manufacturing.

And as they make that adoption in both places, they're able to see this synergy between them where they no longer have this recoding barrier for the technology moving from process development into quality control.

With that, we are able to eliminate further systems, we're able to realize efficiencies, and we're able to get better quality out of the system.

So we see a big land and expand opportunity there, just like Medidata have seen with their solutions.

Okay, here we are completing a study.

This is a drug formulation and stability study.

You can see that One Lab is connected to the 3DEXPERIENCE platform, that we can capitalize the drug development knowledge into the scientific intelligence capability, along with the drug design capability, and all the way up to the clinical batch release.

But that's not all we can do.

We can also develop the device, the drug delivery device.

And here you see a small vignette from our IASO demonstrator.

You can go look at IASO, we've produced this.

It's real.

Biologics, we see an increase in the biologics investment.

These things are hard to deliver to the patient in a comfortable form.

They are viscous, they need to be injected or absorbed.

With IASO were able to design a device that the patient can wear at home or on the road, and it slowly diffuses the large molecule therapy to them.

They don't have to get an injection, they don't have to get an IV bag.

Overall, you are able to create a better molecule to target their disease.

You are able to create a better delivery experience for that disease, all in one platform.

With that clinical batch release, we need to test it.

I'm going to hand it to my good friend, Glen, to tell you about it.

>> Glen: Thanks, Jason.

Now we've got the right targe, we've got the right drug.

How do we give it to the right patient at the right time?

And that is where we come in with Medidata's approach to being the system of operations for a clinical trial.

We need to bring multiple modalities of data together about patients in the real world, and match it up to our virtual expectations that we have established prior to these tests.

What you see here is an illustration of all of those types of data, going into the Medidata platform.

Let me give you a sense of what we then do with them.

Running a clinical trial is an extraordinary complicated business process.

It is dependent on doctors and nurses, operationally, that are not part of the pharmaceutical company or a medical device company that is running that study.

You saw earlier today how unpredictable timing is in clinical trials.

It is because of this dependency, in many cases, between the planned experiment and what is actually happening from a patient availability perspective in the real world.

On the Medidata platform, we help people plan and execute and then analyze every step that is necessary along the spectrum of executing the clinical trial.

And we do that in a way that provides context to data, both in the real world and, apropos to one of the questions about product synergies and road map, actually gives us a context for looking at that data in a more sophisticated way in the virtual world.

So I will give you an example of patient data.

In this case, it's coming from an iPad that the patient is using to enter data.

But this process that I'm illustrating is exactly the same, whether the source of data is a nurse recording something in a specific application for a clinical trial, whether it's a piece of data that's coming from an EMR record, whether it's a piece of genomic data.

It goes in and gets categorized from a clinical data management perspective.

If you're not an expert on life sciences, which is okay, Claire used two terms which are incredibly important: clinical data management, which is what we are looking at here, and clinical operations.

Those are illustrated as Rave EDC and CTMS on this chart.

It used to be two separate systems.

You heard Rouven talk about our clients liking the fact we bring this together at Medidata.

The data manager is looking at the quality of data, and the clinical operations team here is looking at any operational issues.

Any flags that are on that data, to make sure that it's all collected in a compliant manner that is going to meet regulatory expectations.

We bring that together in our platform for every type of data, and we also give it data context.

So, in terms of our platform and the Dassault Systemes 3DEXPERIENCE platform, we actually think about semantic layers.

How we categorize data in very compatible ways.

You just saw Jason talking about that at a molecular level.

Well, that's what we do at a clinical level.

So we can have that data available for reporting from a scientific perspective, or from an operational perspective.

Operationally, this is terrific.

We actually can help our clients do clinical trials in a more efficient way than they are doing them with disparate systems and older processes.

That is one of the things that we have a thousand clients in this building, in dozens of tracks simultaneously, going through.

Learning about all the different benefits you get from our platform in today's world.

But the world of clinical trials and the world of life sciences, as you heard Claire talking about, is also changing.

People are realizing they need to be much more patient-centric than they were in the past.

The old days of developing a small molecule, a relatively simple drug, and putting it into this complex, giant market which had its own challenges, are changing.

That was a population biology problem

It was an epidemiological problem.

Today, as we start thinking about creating individual patients, as we think about precision medicine, as we think about individualized therapies, it’s now a problem that we need to think about on a very personal level.

And that has implications for clinical trials.

One of the things we think about at Medidata is not a light switch, but a dimmer.

A dial.

As patients are being thought of in a more central central way as individuals, not just as parts of a large denominator, we need to start to be able to shift the way we think about clinical trials from that population basis or from something you would do in a clinic to something that is done in a home.

So part of what Medidata is trying to do is not just facilitate that in the clinical trial context, but also set ourselves up to operate in a world where patients are the center of a therapy instead of the physician who is prescribing it being the center of that therapy.

I just want to take an opportunity to also answer a question about users.

One of the announcements that we made yesterday at Medidata was that we are extending what we do in terms of individual apps for patients to actually create a central platform

location for patients who are participating in clinical trials to come and participate in every facet of those clinical trials.

How they learn about them, how they're consented, how they provide data, how they get data back so they can understand what's happening with them.

In fact, the life sciences industry hasn't done a great job of thinking about the fact that patients are not just central to one clinical trial, but we should think about a patient in the context of every clinical trial that they go into.

A lot of cancer patients go into a clinical trial for one company, and then wind up in another trial with another company.

And we are not thinking as an industry around how to create that transition.

Well, that's what Medidata is doing now with our patient platform.

I think one of the exciting opportunities -- and I will come back to this when we get to the commercial part of the spiral that we are showing -- is that that can extend into a platform for patients to be connected to the therapeutic companies that are developing the things that are helping them in a much more holistic and commercial way.

So that means that the million Medidata users that we're adding to the 3DEXPERIENCE platform as of today will actually turn into not just clinical trial physicians, but physicians who are treating patients in the real world and the patients themselves.

So that goes from one million to tens of millions.

I think, honestly, literally, as we incorporate patients into the platform more, billions.

That brings me to analytics.

When you start to think about these numbers, and in some cases the numbers are incredibly small -- I will give you some examples of that – and in some cases the numbers are incredibly large.

There is an opportunity, as Tarek highlighted, for the life sciences industry to do a better job of thinking about generating information from data.

This is a Medidata slide, which you will probably never see these layers on again.

Well, you'll probably see these three layers, but it's missing a really important layer here, which is the virtual layer.

What you will see, again, from a product perspective, is how if you look at the virtual world and the real world, all of these steps along the process of what Jason was illustrating, what we are talking about with clinical trials and what we will now talk about in the future of commercial, actually come together with beautiful parallel tracks.

You've got a data fabric – again, inclusive of research data on the BIOVIA side, inclusive of all the patient data on the Medidata side -- illustrated at the bottom.

At the top, you've got the life cycle of all the activities that are being done today in terms of running clinical trials.

In the middle, Acorn is our brand name within Medidata for our most advanced analytics.

Some of the most rocket science-type things that we're doing.

I want to give you an example of a couple of them to illustrate what I mean about this analytic future, and large and small sets of data.

So, as we think about the world of clinical development changing, as we go from these small molecules going into big, complex markets to large molecules and very specific therapies targeted for very small groups of patients who we can categorize and understand very well at the start of the research project, we need to think about a reality which is that the smaller and smaller sets of patients who get more and more precise therapies may not always provide enough statistical evidence for a regulator, for a prescription writer, for a patient, for a payer, to make decisions around.

So what we've embarked on with Medidata and with our unique data assets, as Tarek and Rouven were talking about, is the ability to take a single patient and reuse their data over and over again.

Again, I know not everybody is a life scientist in the room.

This is a survival graph.

Everybody at the beginning, on this one corner, is still okay.

As you go down, you see people are either having their tumor progress, or they are having a cardiac event, some end point -- could be death -- is happening in the study.

What we want to show is that the curve for the new therapy looks shallower than the curve of the existing therapy.

Well, usually patients are used once and once only in these analyses.

They appear in one of those two curves in one submission to the FDA.

But by categorizing the data on our platform as we have, we are able to use patients in multiple curves, in multiple pieces of evidence generation.

In fact, if you think about the virtual world supplement to what we do here, the obvious, I think -- not simple idea, this is an incredibly complicated simulation we have to do -- but it's to actually add something to this, which is inclusive of a virtual twin in terms of being able to predict, from a simulation perspective, another survival curve.

This is work that we are doing not on paper, and not theoretically.

We at Medidata present this at scientific conferences.

We work with groups like Friends of Cancer Research.

We are at the FDA presenting this, and we are working with clients to use this kind of evidence generation for the submission of new drug packages.

Again, there was the question about competitive differentiation.

I think we are making the rubber meet the road in ways that other people are putting out press releases about.

I will give you another example.

This was a big data example.

Let's reuse the millions of patients on our platform.

I will give you hopefully an incredibly compelling small data example, and it also fits perfectly into everything that Jason was presenting.

So, yesterday we had a presentation from a physician, his name is

David Fajgenbaum.

Not only is he a physician scientist, he also suffers from a rare disease.

It’s a disease called Castleman disease.

I guess, for 20% of the people with Castleman disease, the good news is there is a drug called Siltuximab which can actually keep the disease under control.

It's autoimmune, you wind up going into organ failure and most patients die a couple years after diagnosis.

For 1 out of 5 of those patients, this on-market drug is a great answer.

Nobody knows -- or knew -- how to figure out what patients would be that 1 out of 5.

So what we were able to do is, by taking data in the exact same process that you saw -- remember, we started with data from that iPad?

Well, imagine the other paths for data from clinics, for data about the patient's proteomic profiles.

What genes are on versus off.

We were able to from multiple clinical trials.

Not on thousands or millions of patients -- on fewer than 100.

Bring that data together, stack it up, and do an analysis on it in a way that allowed us to identify not how 1 out of 5 patients – so a less than 20% chance of being right about this drug working to a 69% chance of being able to identify patients for whom that drug would work.

This is literal precision medicine, doing a better job of finding the right treatment for the right patient at the right time.

Okay, so you may not be a life scientist, but if you are a financial analyst you're probably good at math.

So you're probably sitting there saying, "Well, what about the other four patients we're not helping?"

That's where the connectivity between what Jason was talking about and what we have at Medidata comes into play.

One of the exciting things that David was also presenting about yesterday is, if you start to look at the commonality of the patients who aren't helped by Siltuximab, which is related to looking at interleukin six, a particular protein, there happens to be some other commonality.

There's another target called mTOR, and there happens to be a drug already on the market that was used in kidney transplantation that can actually suppress that particular protein.

That drug is now keeping David alive, and has created a whole path for development of new therapies for patients with Castleman disease.

Again, in example one, I was showing you how with data reuse and big data we can make things that created more evidence per patient who is enrolled in the real world, by creating what effectively is a new virtual representation of that data.

This example, we are figuring out how to take these theoretical views of pathways and molecules that can then be applied to real-world scenarios to create effective, incredibly valuable medications in rare disease, which is regarded as the hardest part of life sciences to get involved in and move the needle on.

With that, now that we've got something we can give to the right patient at the right time, I will go back to Jason.

>> Jason: All right.

We have to deal with some regulatory and quality affairs, I think, as well.

So this is what License to Cure does.

I'm going to start with the new stuff, okay?

This has traditionally been a document-dominated world.

It's an arts and crafts project.

Filing a CMC report can take 7,000 hours of labor.

It's risky.

You get audited, you have to show all the evidence.

What you see here is a combination of content and data-driven automation.

The world of regulatory, the world of quality, is going to shift.

On the regulatory side, we are able to, through the semantic data layer, grab the data that we need with full traceability and automate large sections if not all of these critical assets that companies have to produce.

So you can imagine the savings of going from 7,000 hours per filing per year per product down to maybe 100 hours.

Okay?

It's reasonable, we can achieve it.

The objects that show up in these are not simple charts.

There are live business objects, life cycle managed.

You can click through and see the audit trail.

You can go all way back to the source system.

So when the auditor shows up, you go to the artifact in question and you can look at the entire provenance.

It reduces the risk for our customers.

This is where we're going.

Everything is going to be automated, data-driven, scientific in nature.

Okay?

On the quality topic, if we do our job well in process development, we are doing quality by design.

The risk in the quality phase goes down.

We still need to have a quality system.

You will see it in a minute.

We have both the quality, enterprise quality management system, and we have the enterprise document management system.

But I started with the next generation up front.

We are putting all this work into building a semantic data fabric so that we can leverage it to replace these thin-line arts and crafts projects with real data-driven evidence.

It also enables us to do new things, like continuous submission.

We can do this for both the drug and the device.

This is what License to Cure will allow us to do.

Then we need to manufacture.

Just a few facts here for License to Cure -- again, these are from real customer value engineering engagements.

Into manufacturing.

Again, in process development today, most companies are in this phase where they develop the process.

It's a little bit ad hoc, they don't have a process model that they are actually building toward.

They're building a body of knowledge in a document again.

Then they have to go to manufacturing and they have to recode this for their manufacturing execution system.

We can do better.

How do we do better?

When we are developing the process, we are able to put the knowledge into a model.

So instead of building a document, you're building a model of the development -- of the manufacturing process.

Both the device, and then actually the plant.

You can see here you can navigate on the plant, you can do virtual commissioning.

This is a huge value to our customers.

You can simulate large or all elements of the plant.

You can see the ergonomics of the plant.

How is the assembly of the device going to work?

And then you can plan your production.

You can optimize your production.

You can optimize the clinical supply, you can optimize the production supply, you can even optimize the delivery, the optimal delivery to the marketplace, which we are going to get to in a little bit.

You can go in and you can run your day-to-day operations in the 3DEXPERIENCE platform in manufacturing.

This is developed in partnership with multiple brands.

Bernard referred to the power of the brands.

This is developed in combination with DELMIA brand.

BIOVIA brings to the table a deep understanding of bioprocessing, and the ability to monitor in real-time the control strategy and to keep your process running, save you batches.

Here you can also manage your building materials against the manufacturing process.

To make sure that you are compliant and you are able to transfer the technology from development into manufacturing digitally, not through documentation.

Again, this is a huge savings, both in time, error, and optimization of the process.

Now that we've produced a product, we have to go to market.

>> Glen: We've got a treatment that works, we've got all the regulatory documentation to prove it, and we are ready to actually get it to that right patient at the right time.

So, what next?

And this is where, to just put a personal spin on it, I love Lego.

As Rouven and Tarek and I got to know the Dassault Systemes team and the platform, it was amazing how these pieces fit together.

We can now take the other side of the way Medidata thought of the world, before a week ago from Monday, and that is not just the clinical trial data but the real world data.

Data from practices around the world.

Data from EMRs, data around prescriptions, data around reimbursements.

We bring those into our platform in a way that allows our customers to make commercial decisions.

Commercial decisions span a couple different things today.

It is certainly the traditional view of, "what markets should I go into?

What countries should I launch my drug in?

How should I deploy my sales force?"

But increasingly, the way we think about commercialization of therapeutics, apropos to what I was talking about in terms of patients, is in a very much more patient-centric way.

That's not just because the therapeutics are more specific themselves.

That's because we also have a commercial need in life sciences, in a value-based care, in a value-based contracting environment, to actually show that this therapeutic was deployed effectively and produced the kind of therapeutic value, had the level of efficacy and safety that we expected, when it was given to a patient, for a payment to be made back or to not get a rebate.

What you see here is data coming into the Medidata platform from real-world data sources.

It's data that we can put into our semantic layer and actually treat the same way we would think about clinical research data, and assemble it into reports that show safety, efficacy, value, commercial success, as well as scientific success, both at a population level and at an individual patient level.

This is actually an example of a project where, for robotic surgeries – it's a medical device example -- we are not just showing the outcomes of a particular case, a particular surgery for a particular patient, but looking at, from a physician's perspective, from the surgeon's perspective, how well they are doing as well as providing a dashboard back to the life sciences company so they can see at a population level how well the treatment is working.

This is the final step in going from the initial concept of a therapy all the way to, as we're showing you here, its successful delivery.

With that, I will hand it back to you.

>> Claire: Thank you very much.

Let me wrap up this session by focusing on the key benefits that we provide to our customers.

Importantly -- we are basing these KPIs on value engagement that we have been conducting with our customers, and we are benchmarking this against publications in the field.

Importantly, the value we bring to our customer comes from both the top line and the bottom line.

As far as the top line is concerned, we help our customers accelerate time to market by 20 to 35 months.

At the same time we help them increase the probability of success by 30%, which means that, in a given part of time, they can bring more drugs to target medical needs to market.

Now, as far as the bottom line is concerned, we help our customers drive the cost down to by 5% to 10%, and at the same time we help them improve quality by reducing the risk by about 25%.

Importantly, we cannot achieve this result without joining forces together because, as we have shown you today, you need an integrated platform to connect people, ideas, and data.

The 3DEXPERIENCE platform is the catalyst and enabler to make this happen.

Thank you for your attention.

[Applause]

>> Thank you very much.

Claire and Jason -- please, Glen, stay on stage.

Marisa and Jason, can you join us onstage?

>> Glen: Ladies and gentlemen, this is Jason Raines and Marisa Co, two Medidata clients.

Long-term clients, people who we know very well.

Actually, I will let you guys introduce yourselves, and then we'll just kind of talk about our histories working together.

Jason, do you want to go first?

>> Jason: Sure.

I'm Jason Raines, I'm the vice president of data and digital technologies at Apellis pharmaceuticals.

I've been in the industry about 25 years now, and I cut my teeth as a research coordinator years and years ago at an obesity clinic in East Texas.

I fell in love with research and worked my way into the CRO landscape and then quickly into Pharma.

I've been heading up functions in the data management and data science space for – I guess 12 or 13 years now.

I've been partners with Medidata for going back since 2007.

>> Glen: We'll get back to that.

>> Marisa: Hi, my name is Marisa -- can you hear me?

My name is Marisa Co.

I've been in this industry 34 years.

I currently run the R&D business insights and analytics at BMS.

What that does and what that means is they use analytics for three purposes.

One is to accelerate the asset strategy, and most of those curves that Glen showed, my team in collaboration with the clinical scientists and biostatisticians actually run so that we can develop the right strategy for the assets.

I also run the clinical trial analytics, who actually uses that information on clinical trial design to figure out where -- countries and sites we should run the clinical trial.

And then I run the clinical real-world data team that takes all of that that Glen was showing and understands the use of real-world data to actually help reimbursement and value access teams as well as HUR teams and regulatory teams to actually prove the value of our medicines to payers, regulators, health care physicians, and patients overall.

>> Glen: Thank you both for being here.

Actually, Jason has worked at some extremely large companies as well, but we have an interesting contrast.

We have a relatively small versus a very large pharmaceutical company.

Somebody who has come to the business from the more transactional side, versus Marisa from the analytic side.

I hope that what you'll take away is we all are now in the middle in a very interesting place.

Let's start with the transactional side.

Jason and I met about ten years ago.

As you heard from Tarek, the origin of Medidata was doing this thing called electronic data capture.

Making sure that we were replacing paper in clinical trials.

So maybe tell us a little bit about your Medidata experience.

>> Jason: When I became the head of data management at Alcon – this was back in 2007, 2008 timeframe -- we were using a very old way of capturing clinical data from the sites, the investigators.

This method was basically that they would write this information into the medical chart, and then they would have to transcribe it onto a piece of paper.

It was a three-part NCR paper.

This would be sent in to the pharmaceutical companies, it was hand-entered into clinical databases.

Double data entry to make sure we got quality and there were no mistakes between the source of capture at the site to the point at which we actually had it in the clinical database so we can actually do the analytics on it, determine if we have a safe and effective product.

This system was fraught with quality issues, and it was very slow.

Electronic data capture was actually created -- and I think Medidata product was a very viable solution to transform the industry back then and get us away from this legacy and slow and poor-quality processes.

So, we implemented Medidata EDC.

We did some pollening at first, and proved out the concept.

We had some change in management.

Anytime you have a remarkable change in the industry like this, you have some generational-type of pushback.

I think a lot of innovation is related to generations changing.

There was some pushback that we didn't believe this actually worked.

That it was a regulated industry, and how are we going to prove that things that are going into the Medidata cloud are safe, and that they’re not going to do something bad with the data?

There was a lot of these questions at the table.

Eventually we implemented, and we really did some remarkable things in terms of the speed at which we could execute clinical trials and we could make decisions by months if not halves of years.

Faster clinical trials.

We were actually able to decrease the total cost of delivery of clinical trials by, in some cases, in some of our areas, up to 20%.

And the quality was actually improved, and we would get to quality faster.

In terms of quick win/fast fail, different types of clinical trials, we could actually decide to kill a project faster and accelerate projects that we believed were actually working faster, and this ultimately benefits patients.

I can attest to multiple -- through Alcon, Novartis, Biogen, and now at Apellis, I have confidence that I have a partner and I have a capability that enables me to help patients faster.

There's no question.

>> Glen: Alcon, Novartis, Biogen, Apellis.

You are four-time implementer of the Medidata platform.

>> Jason: That's correct.

>> Glen: I think you're definitely on the upper end of that curve, so thank you.

That's great.

[Laughter]

So, Jason and I met in -- I think it was like a software evaluation, originally, for Medidata.

Marisa and I, I think, were sitting together at a medical conference because everybody thought we were crazy and nobody wanted to talk to us.

>> Marisa: That's right.

>> Glen: Tell us about the history you have with Medidata.

>> Marisa: Yeah, before BMS, I worked for Amgen for a number of years.

That's when our paths first crossed.

Back in early 2000, we were not only changing our EDC system, but also implementing a very sophisticated real-world risk-based monitoring environment.

Which means, when you think about how we conduct clinical trials for the FDA, all that data that we collect, all the data that the sites collect from patients and so on and so forth, back in the day -- probably still today -- has to be checked that everything is complete.

That there are no deviations from the actual data that is expected from protocol.

All of that was done by hand, by folks that actually looked at the patient charts and the data that we collect, through many ways.

And actually make sure that all the data was there, was clean, to be able to do the analytics.

To send to the FDA.

Today, with technology and with AI, all of that can be done in almost no time, constantly, shaving months and months and months between the end of the clinical trial and when we have the data, what we call the database log, the data log so then biostatistics proceed with the analysis.

As you can imagine, not doing that correctly could yield to a full submission, which for us is probably one of the worst nightmares.

So that is kind of the one implementation with Medidata.

The second interaction that Glen and I had was almost like a geeky date kind of thing.

We were in Florida at one of the Medidata conferences, and when I retired from Pharma the first time, one of the things that I did was I joined a group of eight volunteers that actually had the thought that we could do a virtual clinical trial.

And we created Mytrus.

I run clinical trial sites, and one of my biggest passions was, "How do we make this very easy for patients?"

Especially in the informed consent.

I saw firsthand what giving a consent, to a patient, was like.

Working with the patient to try to help them understand the 45 pages, sometimes 60 pages, that it entails.

I said to Glen, "Have you ever worked with Mytrus or heard of Mytrus, and is it possible to add the informed consent to the Medidata platform, and continue to create a seamless platform within all the steps of the clinical trials?"

So I am thrilled to see that part of Medidata.

Very recently, we finished a project together where we used the Medidata data housed in the systems as well as the sophistication of the analytics team, the Acorn AI team, to actually save a clinical trial that ran astray.

For those investors who are here, represented significant value to the top line.

We could not have done it had it not been for the Medidata platform and the Acorn AI team.

>> Glen: Thank you.

To connect the dots, that patient platform, the CEO of Mytrus, which we wound up acquiring, was the person, Anthony Costello, our SVP of patient, who made the announcement about our patient platform yesterday.

So, that was a great conversation we had.

I'm going to ask both of you based on what you just said, Marisa.

There's the processes around running a clinical trial today, there is the extension of platforms with things like E-consent and thinking about the patient.

There's this idea of using data to do a better job of, or if we have to, rescuing a clinical trial.

What is your vision -- let's keep it to clinical trials for the moment – of a platform of the future?

What does the future look like in your perfect world?

>> Marisa: Well, to me -- I think I would extend it little bit beyond clinical trials.

Folks in life science, including the way in which most large pharmaceutical companies work, is with the traditional approach that drug development is linear.

Drug development is anything but linear.

What I see, the potential for the clinical trial of the future, if you wish, is you really need to start in the discovery space and the translational space.

Because most of where we select the patients, we stratify the patients, we decide what might be the right drug for the right patient, comes really from an ecosystem that starts with creating the drug, taking the drug to the clinical process, then into the market, and then identifying that for some patients that drug doesn't work.

For the patients that the drug does work, we are thrilled.

But more often than not, especially in oncology, for 75 of the patients, that drug doesn't work.

So we take that information, and we have to go back to the discovery.

Back in the translational medicine, and back into, "What are the patient characteristics?

What are the phenotypic and genotypic characteristics that may uncover why the drug doesn't work?"

And that really is going back to the early stages of translational medicine and discovery, to figure out, "Is there anything else that we can change in the molecular structure?

A change in the biomarker?

A change, or a new biomarker we can pursue?"

And that starts the process all over again with clinical trials, so on and so forth.

So, the idea of a truly connected platform that allows me to understand, at the end of the day, what is that particular patient population?

How do we identify it?

How do we put in a clinical trial?

How do we actually identify where those patients are?

Here, we absolutely need the help of the providers who actually have the patients.

The idea of linking to the real-world data and having a direct access to those patients, to those physicians who have the patients so we can alert them that a drug or a clinical trial might be beneficial to the patient and actually, in a seamless way, enroll that patient in a clinical trial without necessarily having to jump through hoops for informed consent, patient identification, the site survey, and a whole host of things that today with technology could be done seamlessly.

The pharmaceutical companies still are working, some of them, in the 1950s.

So what I love about what Medidata is doing, it's forcing all of us to actually run faster.

Because they are ten years ahead of any pharmaceutical company in terms of how they are thinking about drug development, drug discovery and development, and commercialization, in a seamless, unison way versus in the fractured way we think about it.

>> Glen: Fractured way -- we worked together, Jason and I, when it was really a best-of-breed idea.

“Let's take, as a life sciences company, all these different systems and tie them together and that's how we will be successful.”

And we kind of went into the platform.

What are your thoughts about the future of trials?

>> Jason: Well, I think that was extremely well-said.

When I think about the future of clinical development, it's going to be the accumulation of a lot of different disparate data assets that are coming from a lot of different places.

In some cases, I think -- when you think about best-of-breed and we think about a holistic suite of products, I think that you're on the right path to actually provide a platform by which we can integrate all these different data assets and hit it with advanced analytics to find the needle in a haystack.

Because precision medicine is truly about a patient's response that is really unique to them only.

Historically, it's all been about a brute-force kind of approach, and you test a lot of people.

You have, as an average, maybe not a significant siG&Al to say that I have a safe and effective drug.

But if I hit the right patients, this thing can work amazingly well.

When I think about the engine that has to gather all that information, ten years ago there was sort of a best-of-breed approach.

Because the maturity of the technology and the technology companies wasn’t really there.

Perhaps I had to pick this one and I had to pick this one and pick this one and make them work.

Today, there's not a lot of companies that actually provide this holistic suite of products that actually enables clinical development.

Medidata, in my opinion, is the leading company that can partner with Pharma and biotech to actually deliver all these data assets in a way that actually accelerates clinical development and precision medicine.

And I can defend that by all my experiences with other companies, and the processes by which I actually have to implement in order to get this to work.

So the questions often are to me, "Jason, how were you able to get a lot of these metrics you were able to obtain with Medidata?"

I answer it usually with an analogy of cars or racing.

I want to pick the best car, but everyone else can maybe pick the best car to actually get the fastest record, if you will, or to win the race.

So Medidata is the car, but I actually need professional services.

I need people that know how to drive that car and can teach me how to drive that car in a way that makes me win.

Right?

Winning, for me, is faster and precision medicine, et cetera.

Getting this to patients.

So I also have to have a humility, and be open to thinking differently about this, as well.

This is what I have gotten from Medidata for years.

Glen, I can come to you.

I've come to you dozens of times and said, "Look, I have this problem."

"I'll give you my opinion," is what you say, "but I know you need to talk to."

It's about partnership, too.

It's a technical solution which is a better car than what else is out there in terms of the competition.

Because it is a holistic integrated suite, from consent to lock, post-lock, management of the data in an efficient and compliant way, but also get an enormous amount of confidence and experience within Medidata that I can leverage to help me drive the car better.

What happens in the future is just expanding, I think, that capability.

Integrating data in a more seamless way from electronic medical records, claims, digital, the digital footprint is going to continue to go up.

I think patients are going to be empowered with digital.

They will be measuring their own symptoms.
There's non-invasive hemoglobin apps.

This is exploding.

In a clinical study, this needs to be connected through eCOA solutions, et cetera.

We have the capabilities to really actually push us more in that direction.

With the data sciences and advanced analytics, we can find the patients that need the therapies.

>> Glen: You were on a panel yesterday, Marisa, on data science analytics, and you were talking about success begetting success.

Is this a jumping-off point where we can discuss that?

>> Marisa: Yeah, sure.

Again, what I told you yesterday, which is you are forcing most of us to think differently, to think in a more integrated way, which is very difficult in an industry that has run in the same way for years and years and years, and is fragmented by nature.

The concept of -- at BMS, three years ago, we decided to consolidate analytics.

For commercial, for R&D, for global production supply.

One of the toughest things was to really bring all of these disciplines together, like real-world data and clinical trial analytics and asset strategy.

And start making sense of, how do we deploy analytics to make really faster decisions?

There was a lot of resistance, because that's not the way we think.

Typically, in R&D, we are extremely good at understanding the science behind the data but not necessarily in applying the business concept, using the science to apply to business concepts and make decisions.

I think the early successes that we have, like accelerating a clinical trial, greatly accelerating a clinical trial with data, or using real-world data to actually help a payer understand that our drug, although it appears a little bit more expensive, it actually costs us a lot less adverse events and a lot less hospitalizations that are very, very costly.

So all of that data and insights that we've generated, whether it be to support a better reimbursement or regulatory decisions, whether to accelerate a clinical trial or, you know, using analytics to actually bypass the competition in a trial design and filing early, all of those are now expected.

And the idea of partnering with a company like Medidata, where all that wealth of information applied or combined with a very sophisticated analytics team and in Acorn AI, it only can make us even more successful.

So, part of the success, when we started three years ago my team was about 50, 55 folks.

After that, with the integration of Celgene, we will be about 160 people doing analytics for R&D.

>> Glen: A question about the project that we were talking about, in terms of rescuing a study – not specifically that project, but it was one where we looked at data from outside the walls of your company.

>> Marisa: Completely.

>> Glen: Is that a trend -- clearly we believe it's going to continue, but how do you think about that?

>> Marisa: We have to.

A, we do not have enough information to actually make the decisions that we make.

That's first of all.

The second is, in order for us to make certain determinations and certain – and build models that actually are trustworthy to regulators or payers and so on and so forth, we need millions and millions and millions of data points.

That will not come from the four walls of the pharmaceutical company.

So we are constantly partnering with others who have data, and one of the things that attracts me the most, so many things that attract me about what Dassault and Medidata are doing.

The idea of using, utilizing, and deploying real-world data and certain analysis has allowed us to identify those patient populations for whom the drugs are not beneficial.

We try to build models for, how do we stratify those patients even more, to understand the molecular dynamics of that patient cohort?

The reality is, in order for those models to actually have any validity in clinical practice or even for the regulator, we need to validate.

Typically, the most trustworthy way to validate a real-world model is with clinical data, because that is kind of the standard.

The only company that I know of that has the ability to kind of bridge those worlds is Medidata, so I'm thrilled on that standpoint.

On the other standpoint, because I have been a Medidata fan for years, listening to Bernard today and what Dassault bring to the table, one of the most difficult things in drug development that we haven't quite figured out yet is our manufacturing folks need to figure out how much production they need.

Very, very early, even two years before we know the dose of the drugs that we are developing.

And why is it important?

Well, as former head of finance R&D, I know how much it costs to actually build the manufacturing facility or create production plan, and if you are wrong in certain assumptions about dosing, you might be spending, you know, $5 billion for -- sometimes you need half of that.

Really early in the drug development, in translational medicine, we do clinical studies to actually find what is the appropriate dose to use with the patient.

By that time, it's way too late to tell clinical manufacturing how much we need.

Using the data that Dassault has, as it relates to manufacturing production, with the data that Medidata has as it relates to all the trials, the early trials for dose-finding, today we could potentially simulate how much drug might we need and help our clinical manufacturing folks actually estimate what kind of lots and manufacturing infrastructure they are going to need.

>> Glen: As we now supersize our view -- I think in a good way in terms of the systems and the data, the connectivity -- do you want to take a shot at what the structural changes of a life sciences company will be?

We used to have our little departments for data management and clin ops.

What do you think the company that you're at or the companies you'll be at in the future are going to look like and how they will be different than they are today, Jason?

>> Jason: That's a good question.

The evolution, I think, will require different competencies, so there will be a different talent pool within the organization.

I think it'll be talent that will be ingrained and competent within data sciences, for sure.

To the use case that was just mentioned regarding the ability to actually look at what is needed from a production manufacturing perspective, being able to take all that information and leverage that in such a way that you can create these simulations and predictions, we need support, technically, for that.

Just to be able to understand it, I think.

I think that's one thing.

The other is, from an operational aspect, I think you can actually federate and decentralize, to some degree, some of these things.

Which actually may help out, because the data can be -- what's the word -- democratized in such a way that you can share it freely and in a confident way, to empower organizations to have access, so they are more informed about what's going on either in front of them or behind them.

This creates a culture of accountability within the organization, which I think is going to be important.

I think those types of operational changes will come naturally, as the technology and these data science competencies start to evolve.

The problem statements will shift some degree as a result of that.

>> Glen: I remember lots of times where we introduced new KPIs into projects we were working on together.

The introduction of that visibility and transparency was what changed some of the behaviors, right?

>> Jason: Exactly.

We quote a bunch of different authors around this, but when you measure it, people change their behaviors based on just the fact that it's being measured.

One of the benefits of Medidata, not only the scientific data that is being managed, but also the operational data that is being exposed related to site performance, the quality of the data that is coming out of the system, and you change your behaviors and you become very competitive.

So if you actually have the industry, if you have over 50% of the clinical trials for the last ten years, I can actually benchmark my performance relative to my competition or others.

And just exposing that to the leadership of the company, we're naturally competitive.

We want to be better.

That alone, I think, helps -- even with the sites.

If you expose it to the sites and the investigator sees that he's the slowest or the underperforming relative to his peers, his or her peers, their performance naturally changes.

>> Glen: Actually, I am curious about both of your opinions about this.

That a patient is equally part of that equation.

One of the things, part of your motivation around Mytrus and informed consent, putting things in front of the patient will actually make the patient behave differently.

That could have real therapeutic impact on the outcomes of the therapies you're developing, right?

>> Marisa: To me, going back to your question, I don't think we will see massive changes in organizational structure.

I think companies have structures just to make sense of the chaos of drug development.

One of the things, at least at Bristol-Myers Squibb, one of the things we have noticed is through our digital health effort, which was a company-wide effort where leaders from many functions actually came together to figure out what are the questions we need to resolve, and how do we go about resolving them?

And then out of that came the operating model that now allows a translational medicine person with a biostatistician, with the regulatory person, the analytics person, actually to work together to solve those problems.

That mind-set that there is no single group that can actually solve the problem.

You need a village to raise a child, I think you need a village to raise one of our children, that is a drug that we need to get to market.

So, to me, A, the talent that we are bringing into the company is one.

They have a very different approach to how they work, and an expectation that they will be part of an ecosystem, not part of an organizational structure chain.

>> Glen: More of a collaborative change.

A difference in the way – actually, Jason was talking about it before, people communicate.

When you are doing science at certain scales and certain models, you need to have the communications integrated into the actual innovative platform.

>> Marisa: Indeed.

>> Glen: So, a lot of what Medidata has done over the years has come from our clients, not from us.

Actually, Jason and Marisa, as you've heard, have been involved in many of those conversations.

So, I like a little pressure.

I didn't tell them I was going ask them this question, but now you've seen a bunch of things.

Do you have any requests for what you would like us to work on next at Medidata?

>> Marisa: Well, how many hours do we have?

[Laughter]

>> Glen: I have the rest of my life!

[Laughs]

>> Marisa: There you go, I will take you up on the offer!

>> Glen: 5 minutes.

We have 5 minutes now, but we will keep working on it.

[Laughter]

>> Marisa: To me, again, in the spirit of precision medicine, precision medicine requires not only data and analytics and the physicians, but precision medicine requires that we convince the physician that an algorithm could be the solution to a diagnosis and a treatment.

For that, to convince the physician or to convince the regulators that that is the case, we are going to need to validate all the models, simulation, all the models that we put forth as a treatment pattern.

One of the things that I was talking to Glen about it is, in order to do that, we need to now bring the power of real-world data, the power of clinical data, combined with our kind of regulatory experts and our biostatisticians, and start really developing tools that will be deployed to physicians to ascertain and to decide which patient requires which drug with a lot of degree of confidence, and validation that that is actually the right treatment pattern.

Because of two things -- one is the patient privacy laws will suggest that -- there is a clause that says "the right to an explanation."

Physicians that don't understand the black box of any AI model, so on and so forth, will never use an AI-driven decision to actually tell the patient what treatment they need to pursue.

So I think, for me, if we want to make precision medicine in reality, especially in therapeutics, I think we are going to have to work together across the aisle between the real-world data space and the clinical space.

To actually validate those algorithms and convince the regulators that we can do – you know, we can stratify patients and decide treatment algorithms through AI.

>> Glen: All right, Patrick and I are on that one.

Jason?

>> Jason: To that point, I think the FDA and other agencies are thinking a lot about the black box and the AI.

So they are creating guidances and modernizing.

They are thinking about how to actually create software as a medical device, and an algorithm as a treatment recommender, if you will, or a therapeutic recommender.

One of the gaps I would like to see Medidata and Dassault work on would be -- I think one of the issues we have with patients is that they don't really control their medical record.

So, how can we technically solve that problem as an industry would be something I would love to see you guys work with.

Because you have the clinical data, you have access to real-world data through claims and pharmacy, and different mechanisms of extracting this from the insurers and EMRs, et cetera.

But the patient, if they want to really subscribe to research, how do they get their retrospective pool?

How do they get their genome and their phenotype, all the treatments and the polypharma that probably exists that actually can help with stratification, can help with actually marrying that up with the clinical studies to do this profiling that's really needed to decide which patients are going to be more susceptible to a certain treatment or an adverse event pattern?

That, to me, might be something that you can actually supplement or augment your suite of products with, that enables a patient the opportunity to go in and say, "look, I want all my information to be housed.

My medical record, I want to participate in clinical trials.

I have anything under my control and in one environment."

And just imagine the power of that, if it gets big, to Pharma and Biotech to actually exploit.

That, to me, is something that would be exciting to think about.

>> Glen: That is actually kind of an interesting set of things together.

You've got the black box.

Even giving people, the patient, the visibility of what the inputs to that black box are is an improvement of we have today and probably a prerequisite to getting people to understand, trust, and have that validation.

>> Marisa: If I can have one more wish, when I close my eyes and dream, now that you guys partnered with a European company, right?

As much as we have availability of data in the U.S., we have very, very little as it relates to access to patients in Europe.

And I was talking to the European Commissioner not long ago, and she said to me, "Marisa, we have shown that we can reduce by 50% the time to disease diagnosis.

From 5.2 to 2.5 years, just by using data.

And yet, only 9% of our patients have access to EMRs, and most of them, limited access to EMR.

So, to me, and there's a lot of momentum in Europe to drive digital Europe, to drive this very conversation and the interoperability of platforms.

I think what they need is really somebody who understands how to do it.

There is a lot of momentum and there's a lot of investments in this area by the European Commissioner.

We are talking about 5 billion euros, which is not a minor undertaking.

I think we need solutions for our European counterparts.

>> Glen: All right, it's on the list.

Jason, Marisa, thank you so much.

You guys are very busy, it means a lot to us that you take the time.

Hopefully you all think this is worth it, and join me in thanking them.

[Applause]

>> Bernard: Thanks a lot, Marisa and Jason.

Pascal and Rouven, can I ask you to go on the stage?

And you will have a Q&A session after Pascal and Rouven's presentation.

>> Pascal: Good morning to all of you.

Good afternoon, for the ones attending the sessions through the webcast.

It is my pleasure to conclude the sessions, and I hope you saw many examples, concrete illustrations, of what I shared with you.

Almost since June, since the acquisitions.

So before, I've got to make a quick disclaimer, not a forward-looking statement disclaimer.

Because it's due to articulation.

Please do not tell me at the end of my session that it's almost the same as usual.

I'm not sure I will take it positively.

[Laughter]

So, what I want to do today is really to focus almost on the three questions you raised since we announced the acquisition of Medidata.

It does not mean that what you have seen today will not contribute for the growth for the next 10 to 20 years, but I want to focus on the year 2018, year 2023 plan.

That is the purpose of my presentations.

The three questions I want to address are the following:

the first one is, "why have you made such a big investment in health care?"

Remember, during the road-show at the time, many of you asked these questions.

And we will give you some answers.

The second question, "it's a domain, per se, with a lot of players, and we're not sure we understand the competitive landscape, and how you are planning to differentiate yourself."

I hope you have seen some concrete things today, but I will come back on this.

And the last point will be, finally, "what would be the contribution of Medidata to the year 2018-2023 plan?"

For that, I will share the presentation with Rouven.

Because Rouven is a former CFO of Medidata.

But now he's the COO.

He's a guy being accountable to make the post-merger plan a reality and a success.

That's the reason why I want him to be on stage with me, because it's a way for him to be committed.

I'm not the only one.

Okay?

So this is for the introductions.

So let's start for the first questions.

Why are we investing so much money in health care?

You know, we are a long-term company.

Being long-term means many things.

It means we have to prepare the growth at least 10 years in advance.

The proof of that is not only we are sharing the 20-year visions with you, and this is what Bernard did this morning, we are committing our plan on 5-year periods.

But we have also to think this way.

I took the framework, the purpose.

You have seen it.

I put the presentations, the GDP, and you see that the traditional manufacturing industry represent 20%.

The, what we call "infrastructure and territory," is close to 50%.

To a certain extent, you could ask me the questions, "why you are not reinforcing the position you have in the manufacturing industry" or, "why are you not trying to expand the footprint in infrastructure and territories?"

And the answer is here.

If you look at the growth, because at the end, the only purpose is to fulfill the growth.

The organic growth in the long term.

The GDP growth for the health care is twice than the other.

At least, this is what we are expecting for the next 20 years.

And the reason to believe are the following:

There are two.

You know, today, only half of the population have access to health services.

Only half.

So 7 billion people, only 3.5.

It took, for many countries, more than 40 years for them to be able to cover 100% of the populations.

This is what has happened mainly in Europe and in the U.S.

More recently, you have countries like Spain or others, Korea, it took 20 years.

And if you look at the last trend, China, for example, it's only 10 years for them to almost have access to coverage of 100%.

In all nations, they took the commitment that in the year 2030, 100% of the worldwide population will get access to the basic health care services.

So this is at a high level, a big trend.

The second trend is the following:

There is a strong correlation between the life expectancy at birth with spending.

And you will notice on this graph, you have blue bubbles.

An average, it's around $4,000 per capita.

The life expectancy at birth, it's exceeding 80 years old.

You have exceptions.

The U.S. has spent almost twice, and the life expectancy is a little bit lower.

It means that health is not only the health care and how you treat it, but it's also how you behave, how you take care of yourself.

So I do not want you to restrict the definition of "health care" to only the Pharma and the med device sector.

It's much broader than that.

And we are engaged to bring also this in the long term.

Then you have a bunch of countries where usually the coverage is not 100% population.

We see these acceleration trend.

If you combine those two things, we have reason to believe that the GDP growth for the next 20 years will be twice the traditional manufacturing sectors of the infrastructure and territories.

That is the basic reasons why we took these decisions now, to invest, to fulfill the organic growth for the next 20 years.

But, there is a "but."

Because there is no way you can give access to the health services, to the worldwide populations, the same way we did for half the populations.

The economic equations need to change.

I think Tarek highlighted in a very good manner in this presentation, when he told you that there is a new innovation cycle starting.

And I think this is a reason why we have the legitimacy to be in this space.

Because you could also question, "why, guys, what would be your value-added to come to this?"

And again, we are convinced that the innovation cycle in this industry is science-based.

Everything we do, since day 1, is based on the fact that we put science into an I.T. system.

So that's the reason.

The second reason is because, you know, you have seen this number.

There's a lot of inefficiency.

You know, this industry cannot continue to spend as much, and the health services has to be affordable for the worldwide populations.

The economic equation needs to change.

This is where we play a role with this.

Again, it's everything you've seen, I'm just summarizing for you to be sure you have the story.

What we are bringing is unique, because not only it's a way to cover all the different disciplines, to foster innovation cycle, and you have seen it in action with Jason, Glen, as well as Claire.

And you also have listened carefully to the testimony of the two customers.

But it's because, you know, as Bernard said, we have a different way to promote this value.

The first one is, through the solutions, we are maximizing the outcome.

And the outcome is at stake for this industry.

The second thing is, if you want this to be a master with a high level of quality, with a lot of efficiency, with reducing the time cycles, you need to also foster the collaborations between all the different disciplines.

And we have defined the processes to make it happen.

And last but not least, with all the roles we have to cover, all the different disciplines, we know how to equip all the people being involved in this innovation cycle.

Everything is relying on one single platform, and remember, this platform is unique because it's the only way, the only platform being able to manage the knowledge and the know-how in a collaborative manner, combining the two approach.

One, which is a data science, and the other one, which is a polar of the imagination through modeling and simulations.

That's the core of what we do.

If you look at the landscape, and I briefly discuss it through the clinic, it's highly fragmented.

None of the competitors mentioned in the slides could do what we are doing.

Let's take -- I made several categories -- if you look at the highly-specialized one, especially the guy being upstream, they have domain expertise but they do not have the platform.

They do not have the go-to market.

They do not have the full industry expertise.

To a certain extent, they have really good solutions, but as many customers say during these events, their knowledge and know-how is stuck in one single system.

And there is no way you can flow this across the area of the organizations.

Then you take the big one.

You know, the one you know because they cover many, many different industries.

They have an I.T. platform but, frankly speaking, they do not have industry expertise.

This is probably the reason why Medidata won many market share against one of the big names mentioned, Intuit.

It's also true for the manufacturing parts.

You know, this industry is science-based, and if you don't know how to mix the science with industry expertise, you are not in the game.

And last but not least, you have a newcomer.

You heard the name twice at least.

You know, if you look at the reality, they are doing revenue with CRM systems.

Salesforce automation.

This is where the revenue is coming from.

The revenue is not coming from the product life cycle or the drug life cycle management.

Even if they claim they have an ambition.

If we zoom, they only have a point, which is quality and compliance management.

And through the demo you have seen from Jason, I hope you will understand through this demo that the game evolved to be document-based, because we have to be data-driven and generate automatically all the reports for the regulators.

That's the way we are planning to do the change.

That's the way we want to be game changers.

My point is no one in town can replicate what we have.

If you sum up the industry expertise, the platform,

the knowledge, and the domain expertise, and this -- combined with two teams willing to be together -- and Tarek explained it very clearly that the culture is the same, the DNA is the same, and the will to transform this industry is here.

So, the third question is quality to the contribution of our 5-year plan.

The first point is this one:

remember, we committed to double the addressable market over the time.

Going from $16 billion to $32 billion, U.S. dollars.

With the 3D experience platform we see in 2012.

Where are we?

Today, we will see, there is animation on the slides, sorry.

Yes, thanks.

It is a $38 billion -- U.S. dollar -- addressable market, of which $8 billion is coming from the health care.

And against this market sizing, it's a pure software revenue.

It's the compilations, the addition of all the existing revenue coming from all the point solutions you have seen previously.

This does not take into account that you still have homegrown systems running in many, many pharmaceutical companies.

My point is this quantification of the market is probably the minimum quantifications.

The second message is the growth expected is 10% growth.

On an annual basis.

And the main drivers for now on the slides is growing pipeline of drugs.

Today, it's more than 16,000 new drugs in the pipeline.

It's almost twice compared to the year 2001.

You see an inflection point, because in the year 2013, the trend changed dramatically.

Which is proof that there is a new innovation cycle going on, and this is proof also that the complexity of developing new drugs is higher.

Because you need more options in your pipeline to make it happen.

That is what's driven the market now.

Knowing that my belief -- and I think it's also the belief of the Medidata teams -- the coverage of this market is not well-done.

You know, you only have a few companies being served.

The penetration of all the solution is quite limited.

It's almost absurd.

If you combine all those levers, I am pretty convinced that the 10% growth will be sustainable over the next 10 years.

Now, how do we split this market?

Again, it's for you just to have a sense.

So you have the three big existing markets.

ONE Lab, you seen it with Jason's demonstrations.

The clinical trials, and the production side with what we call "the need to cure."

It doesn't mean the others are small.

It means that the others are not well-deployed.

That's the point.

Okay, that is for the market growth.

Now, from a market share standpoint, where are we?

With a combination of Medidata and Dassault Systemes, we are number one, with 9% market share.

Almost twice than Oracle and SAP, and slightly ahead compared to Veeva.

But I just want to remind you that in Veeva's numbers, two thirds of revenue is coming from the CRM.

It's not coming from the market we want to tackle.

That's very important for you to understand.

The second message is, if you assume that the market growth will be at 10%, and we will continue to gain at least half a point in terms of market share per year, we will be able to continue to grow at more than 15%.

That's the point.

Now, how this combination will work effectively?

Here is the way we want to do it.

Medidata is becoming a business you need as part of Dassault Systemes.

You've seen the management team with Tarek, Glen, and Rouven.

They are the leaders and they will continue to run this business and grow this business, leveraging the rest of what we do.

The life science industry is becoming the second largest industry for us, slightly behind the auto sectors.

But bigger than the aerospace sectors.

And I remember, you were pushing me.

Punching me, I should say.

It's not because I have stitches in my mouth, but punching me about that we have too much dependency on the auto sectors.

To a certain extent, you have an answer now that we are balancing the revenue and the footprint across multiple industries.

Last but not least, we will combine the go-to market of BIOVIA with Medidata.

Because there is so much company we are not serving.

You know, I gave already the numbers, but if you think about it, we are touching only a third of the market.

We are touching a third with almost a third of the portfolio we have.

That's the point.

So if we structure the go-to market, and it will be a dedicated one.

It doesn't mean we want to leverage the rest of what we do.

It has to be dedicated, because coming back to the question we had during the Q&A, it's a different way to engage.

It's a different way, because they are at a different stage of maturity.

We need to be able to start in a different matter compared to other industries.

So that is the reason.

The second reason is because you need to have a high degree of industry expertise across the fields of operations.

And it's not easy to build such a team.

I think if you combine the two teams, we have by far the largest field operations to serve this market in a proper way.

In addition, Medidata and I, and Dassault Systemes, we started building complete ecosystems.

You've seen during Tarek's presentation, companies like IQVIA, and I remember some of you during the road show telling me, "but they are your competitors."

And I said, "no, they are our partners."

Why so?

Because you know we have an indirect model for the traditional manufacturing industries.

Some promote and market through an indirect model.

We could do the same.

But they are a different nature of partner, and this is a good example.

They could become our partner to at least expand the reach of this market and serve them in a proper way.

With, again, a level degree of expertise, and maybe some new business model.

Because we could be much more linked to the outcome of what will be produced with our software.

Rouven, I think it's time for you to come.

Because I think you have a few things to say to the crowd.

>> Rouven: Thank you.

Thanks, Pascal.

Yes, Pascal, as you already introduced, I think what's top of mind for you is to understand how does our growth plan going to look like for the next five years?

Before I go through the components, what I want to start with first, we think this is a very attractive plan for investors.

Secondly, we believe, and we are very confident, that this is achievable for us.

The 13% to 15% is what we are targeting now for the next five years, every year.

And there are a few things -- this is a very simplistic summary, but I think it is a good framework for you to think about what the different levels and sectors of growth are going to be for us.

The first one, our core business.

You heard a lot from Glen earlier today in the product presentations.

And our really strong presence in electronic data capture and how we serve the life sciences industry and operate clinical trials.

At the same point in time, Pascal just walked you through the over market economics.

So it's a very strong-growing market.

We have a very good track record of taking market share from the competition, Pascal alluded to this.

So we feel very confident that we continue over the next five years to take market share from the competition, number one.

Number two, that there is continuous growth in the market.

There will be more clinical trial started because that's how the industry, as Marisa said, that's how they're changing.

There will be more precision medicine, more trials.

This will be more opportunities for us to monetize.

And then the third point, and that's why I was so particular earlier in the morning in my presentation, was around our pricing model.

Because the way we've defined our pricing model, we are capturing at the level of clinical trial metric, the pricing.

So the way we are contracted with our customers, they don't think they have an all-you-can-eat type arrangement.

They don't have that.

When they start more trials, we will be able to charge more.

This will be the reason why we can monetize this growth with our core capabilities.

We believe that six points of the 13% to 15% over time will come from our core product offering.

That is also what we have shown over time.

So we have a good track record of at least delivering these growth numbers.

And then, again, you saw the capabilities that we have built through continuous innovation.

We serve, really, from the submission from the enrollment of patients all the way to the submission of data to the authorities.

We cover all aspects of the platform.

So we have a lot of products and capabilities to attach to increase our share of wallet.

That adds another four points, we believe, conservatively.

If you put that together, four core competencies, that's about 10 points of growth that we will add over the years by continuing to do what we do.

I will also mention one additional point, I think Pascal alluded quickly to this as well, as well as Marisa, mentioned the difference between the U.S. and the European market.

When you look at Medidata, we are very focused on the U.S. market.

We have about 75% of our revenue is U.S.-based.

Now we will be part of a European-headquartered company, and I think our presence in the market will be much stronger.

That gives us better access to clients.

It will also strengthen our core business.

So I think these are all arguments to believe that the 10 points are realistic.

For data and analytics, you can see this is really one of the big opportunities that we have to help transform the industry and, conservatively, we are assuming this to have very much a contribution to our plan.

Of course, we are much bolder in the way we pursue the opportunity.

So I leave it there.

Professional services.

We talked a lot about the importance of it.

They are are an enabler for transformation.

The domain knowledge is very critical and it's differentiating us in the market.

So that will continue to add growth to our company as we grow.

So this is also nothing changing compared to what we've been doing.

And then, I think we also wanted to make sure that, as a combined company, we have to really be thoughtful around how we address our synergies in the market and how we build the framework to go after a much, much bigger opportunity.

As we heard, our customers need us to transform.

And we can only do this together.

Bringing these capabilities together should at least add 2 points of growth over time.

You see, we don't consider this to be immediate, but over time to contribute marginally to our growth.

Of course, with the goal to be much bolder and drive more growth from that.

So that is the topline picture.

Now let me transition to the bottom line picture.

Here, also the same time frame, the next five years, our plan is to achieve 27% profitability.

That is about two percentage points increased year-over-year, or 200 basis points, year-over-year increase.

We believe that we have a real opportunity to improve our margins, while at the same point in time, we continue to invest in growth and innovation.

We have done this as a stand-alone company.

We always had about 80 to 100 basis points organic, margin improvements year-over-year.

Driving, operating leverage in our core business, that's one thing we will continue to do as well.

You see operating leverage, we estimate that to continue with a contribution of about 6 points to this plan.

So that is about half of the 200 basis points per year that we will achieve.

A little bit more.

But this is, of course, a framework.

And I think maybe conceptually, to add to this, there might be ways for us to achieve these numbers.

It's not just one way.

There are multiple levels that I'm introducing here.

Of course, we have an opportunity to really go after synergies and accelerate the path to increasing profitability by combining the organization.

For us, when we think about a number of areas in R&D, we've been becoming -- as a cloud company, more and more exposed to some of the increasing cost trends that infrastructure as service companies like AWS have introduced to us.

We now have an opportunity to reverse this trend by leveraging Dassault Systemes capabilities over time and really become more efficient in providing our services' cloud power to our customers everywhere in the world.

Right?

That's so important.

That's also where the regulation is changing.

We have to be closer to our customers.

This would otherwise be, as a standalone company, massive investments you would have to take.

Resources, engineering resources, as we continue to grow our portfolio, we have a real opportunity to optimize our resource mix and location mix.

This is something that would have been an opportunity as a stand-alone company we would have to do.

Now we are having an infrastructure we can work with and tap into.

So that gives us an advantage.

These are just two very high-level points.

And then G&A Synergies,

as every one of you would expect, are we going to contribute to that?

I give you a couple of sound bites, we will have much higher buying power in the future.

We are going to be working with an organization that already has a large presence across the globe.

We have 16 offices today, I think Dassault Systemes has 180 offices.

We don't need to invest into real estate.

We are going to be part of Dassault Systemes, who is already present.

We can mitigate and reduce a lot of those investments in the G&A area.

So that is the high-level outline.

I hand it back over, back to Pascal.

>> Pascal: Thank you, Rouven.

Stay with me because the last slide is the result of, what you just explained, is a contribution to the 6 euro EPS target for 2023.

And you remember, we sliced the 6 euro EPS in different pieces.

The one coming from the adoption of the expense platform by the largest we have.

The second one is the continuum of the industry diversification.

And we had these KPI, or I will say target objectives, to have 80 cents coming from acquisitions and new business model.

And among the 80 cents, 70 would come from what Rouven just presented to you, assuming the plan -- which is almost doubling the review of Medidata in the next five years -- and gaining almost 10 points over five years.

The rest of the assumptions stay the same.

I mean, I didn't change the currency.

The tax rate is the same.

You can run on the same assumptions.

There is only one or two things.

You will remember, now we have debt, and the financial interest and contribution will not be the same.

So clearly, we expect to have deleverage over the investment cycle.

To come back to one time, EBITDA net debt over EBITDA ratio in the time of the investment cycle.

And so today, after the transaction, we have 2.5.

Last but not least, there is -- the EBIT margin of Dassault Systemes, including Medidata, will not be below 30%.

So you have my commitments that we will stay at 30% plus.

I think what Rouven shared with you, it's not only a realistic plan, but we know how to do it and we have been able to demonstrate on both sides that, when it's time to put in place the right set of actions, we know how to do it.

That's it.

I think it's time now to take some questions.

And to do so, maybe we will ask all the different presenters to come on stage for this part of the session.

>> Thank you, Howard, Griffin securities.

Two questions.

First, I would like to return to the subject of integration, specifically product or technical integration.

We saw some examples earlier of the life sciences industry solutions you've already introduced by DS.

And those were the culmination of one of your most important internal initiatives for a cross-brand integration, across DELMIA, SIMULIA, BIOVIA.

But those did take time.

So the question is how are you thinking for the intermediate term of the initial batch of copackaging, cointegration, between Medidata and what we just saw on the life sciences side from DS?

And who in fact would manage that?

Who is going to manage that process?

Secondly, we've heard the term "outcomes" quite a bit today, as in "patient outcomes," for example.

What is the potential for employing outcomes-based pricing model and/or marketplaces to any or all of the life sciences development, commercialization, and or even patient therapeutics?

>> Pascal: Glen, you take the first one?

>> Glen: Thank you.

Actually, as you heard from Marisa earlier, a lot of the projects we do that are innovative, they are using use cases with clients.

So I expect there will be projects where we will collaborate with the other teams at Dassault Systemes in terms of delivering the first iteration of certain use cases.

Obviously it's going to be use case dependent.

But that's where we'll bring the elements of data together, the elements of the ontologies together.

I don't know if I'm going to scratch the itch on what day something is going to be done, but that's because we are in the process of identifying those exact use cases in those first clients.

That will then proliferate into more and more platform integration.

>> Pascal: Maybe I could add a few things.

So, from a timing standpoint, the first phase is, again, as Rouven says, is the leverage the cloud capability we have.

So the number one priority from 2020 is to substitute progressively the cloud, the infrastructure, with 3DS health care.

Point number one.

Point number two, we have the two platform.

The two platform needs to be connected.

And we have a strategy, so called POWER'BY, to make it happen.

So we will develop the POWER'BY strategy in 2020.

It will be probably on the market in 2021.

And then we will start to develop, as Claire and Glen and Jason demonstrated, some, I would say, combined products.

Again, we will start the development in 2020, but you notice that in the revenue synergies Rouven was highlighting, the most of the impact will be 22-23.

So this is, in term of sequence, what we are planning to do.

And we expect to have the completeness, I would say, before five years.

Right, my friend?

>> Rouven: Yes.

>> Pascal: The second question, regarding the outcomes, maybe for you, Tarek?

>> Tarek: Happy to answer.

Customers are at times quite interested in risk-based contracting, outcomes-based contracting.

What we've seen typically happen in the past is that when we go down that path, as they start to think about what the upside or the downside for them, but the upside for us, is they come back to a much more traditional contracting model.

The one space where I see that there's a divergence in early days is with Acorn.

Because we see that some of the smaller biotechs, who are so tied to outcomes, and there's lot of potential variability.

They want to either get to the finish of a study so that they can submit to the FDA, or have a monetization event, maybe more funding or sell the company.

They're willing to put more of the contract at risk.

And quite frankly, we do have an interest in doing that.

But it's going to be, I would say, over the next five years, a relatively small part of our overall strategy.

We are certainly open to it, but there is not that much industry momentum behind it.

>> Pascal: Claire, you maybe want to add a few things?

>> Claire: Yes, sure.

So, in the past I've been involved with pressing reimbursement at the ministry of health in France, and I've seen growing interest in outcome-based payments.

And so what I want to say is even if we remain in a traditional pricing model, there is already a lot we can do to help life sciences companies moving toward these outcome-based contracts.

Because they need to be able to demonstrate outcome to payers, and all the data science that we do are going to have them do that.

But then, if you think about the 3DS platform, there is really two sides of the coin.

There is the platform as a system of operations, and we could already have life sciences customers move toward outcome-based pricing.

But now we should think about the 3DS platform as a business model.

There is much more we can do to connect the extended value network.

And here you might want to think about more innovative ways to price, outcome-based payments being one of those ways.

>> Market estimates weren't out there for Medidata all the way to 2023, but there was already some pretty bullish expectations for 2021.

If we extrapolate those, clearly reconciles with your helpful presentations around what you are expecting for the business.

Notwithstanding your comments around the product road map and how that comes together later, given the compelling logic we've heard today and the encouraging response also that you spoke to among customers, is there not an opportunity for nearer-term synergies, purely from the coming together of the two sales organizations?

Linked to that, I wanted just to ask you for a little bit more detail on the go-to-market.

You mentioned maybe an opportunity later to pursue the indirect channel.

At the moment, what is the sales process like for Medidata?

I presume it's a very complex and long sales cycle.

Is there some overlap and benefit there to coming together of the businesses?

Thank you.

>> Tarek: Let me take the second question, if that's okay.

Our go-to-market model, it's a mixed model.

So let me explain.

We have a direct model where we sell to Pharma, life sciences, med device, and we have a sales force, a field sales force, as he would imagine, geographically based.

And they sell the breadth of our solutions.

There is an indirect channel, but it's not in the sense of the Dassault Systemes indirect channel.

There are CROs and some SIs who are also are partners in sales.

We view them as our indirect channel.

But they are really implementers, so the CRO industry has multiple functions for pharmaceutical companies.

But as it relates to clinical development, they are outsourced data management.

There are outsourced monitoring.

So going to the clinical sites and making sure everything is happening, and then there are some other functions that they provide.

Historically, we've worked with them as a channel partner.

So what they would do is they would co-bid.

Let's say there's a study being started, and the CRO wants to do the implementation work, they would co-bid Medidata's PVC product, for instance.

When we won, it would either be on both of our paper, on their paper, and we would always be a path pass-through, always a pass-through to the customer.

That relationship with the CROs has changed over time.

It's become much more strategic.

Where, they are consuming our products both make their own operations more efficient, and they are committing to use our technology, and then reselling it as they resell their services to the pharmaceutical companies.

So that's the model that we've had.

We continue to see the CROs play an increasingly larger role in our sales efforts.

But we will have maybe -- I would say at this point about a 70% plus of our revenue is coming from our direct channel, and that's going to continue to be a significant effort on our part.

So in fact, as we come together as organizations, the breadth of what we can do on a global basis from a direct perspective actually increases because of, as Rouven mentioned, the presence of Dassault Systemes in Europe is stronger than we are there.

And also there for much longer -- a much larger presence in Asia Pacific then we do, even though we have a certain amount of revenue that comes from there.

China, for example, is a very high growth market for us, but I think we can accelerate there.

>> Pascal: To complement what you just say, the CRO is only a category of partner for the research.

But you know you have the equivalents for the manufacturing side.

So clearly, it's entirely new ecosystem we are able to build to expand the footprint and the reach.

Please keep this in mind, because it's only the starting point.

Coming back to the question, what can we do in 2020 from a go-to-market standpoint?

We have to be realistic.

The two teams would be together for the first time.

I do not want to take the risk to defocus them.

Because it has to be well-prepared.

The plan is the following.

We are working on a name list of accounts, so it would be a limited number of accounts, and we will approach them together with a combined value proposal.

For the rest, we will continue in 2020 to promote independently.

But it's only for 2020.

>> Great, thank you.

Pascal, on the financial plan, I was surprised at the G&A optimization is limited to two points, given Medidata's G&A sales ratio is actually quite high.

I think it's in the double digits.

Are there additional investments you are sort of baking in?

And also, when it comes to sales and marketing, is there any optimization there or even acceleration of spend baked into the plan?

And then lastly, on cash flow, I know that the cash conversion of Medidata relative to Dassault is quite different.

Can you shed some light on any plans to improve cash conversion?

>> Pascal: I will start with the last one, and a maybe for G&A you can add what you want to, Rouven.

Feel free.

For the cash flow, if you do the math, you know you have a revenue going between 13% to 15%.

And you have a leverage of almost two points per year.

Automatically, the cash flow is almost triple over the time of the next five years.

So going from a little bit less than 100 million to a little bit less than 300 million.

This is the plan.

I am sensitive to that, because as you know we have debt.

And we took the commitment to deleverage rapidly.

You remember, for the first nine months, we have generated a billion.

So you could expect us to continue to be on the same trend for the next few years and have all the cashflow that would be used to reimburse the debt.

That's the plan.

On the sales and marketing, you know, could be accelerate and spend more?

Yes.

But before, I think Bernard stated very clearly, the customer needs to be ready, also.

And this market is shifting now.

So I do not want to be in a position whereby we overinvest in sales and marketing and discover that it's taking more time than expected to ramp up the sales.

You almost blamed me for the last five years because I was too pushy on the 3DEXPERIENCE platform, and now you start to see the light with big deals coming.

So I want to be almost in the same position, manage it collectively, because we are in the same boat, and we will decide together how far we go from an investment standpoint on the sales and marketing sides.

But right now, I think there is so much we can leverage by having our sales people promoting the combine solutions, that it's probably the first priority for us.

On G&A?

>> Rouven: Maybe before I come to G&A, one maybe clarifying aspect to cash conversion on the medidata side, cash conversion is almost always a function of the timing of invoicing.

I think our invoicing timing is very different to the way Dassault Systemes are currently operating it.

Of course, it remains for us to see if we are going to adopt this and change.

But we typically invoice quarterly in advance.

We have some contracts where we also invoice in the rear based on the consumption basis, so that delays cash generation.

That's just to keep in mind.

We have a track record of increasing cash flow over time, so it's never been an issue for us.

On the G&A side, I think to answer it very simply, no, there are no income limit investment plans that would be a headwind for us to be able to get more leverage out of G&A.

In more detailed terms, and mentioned buy-in power.

I think we have to still quantify what that is going to look like.

We wanted to be prudent.

Secondly, we will be -- as Medidata, we haven't taken the step yet to think about global shared services.

So we pretty much operate with a template operating out of the United States, which would give us an opportunity to tap into certain infrastructure of Dassault Systemes that I think will give us definitely income leverage.

I don't think see that we will have to invest into G&A to continue to grow our business as we have been had to do in the past.

And so all these factors will contribute.

>> Pascal: Last but not least, this story is not about cost saving.

It's about growth.

There is something Medidata is doing, we do not have yet the full experience.

It's a process business model.

So all the G&A have dedicated to support the process model, and they think it's our common interest with the rest of what we do to leverage this expertise and to a certain extent diffuse,

put the right leaders at the right place, and we want to capitalize on the current organizations to make it happen.

>> Just a follow-up question on share-based compensation, and how you expect that to evolve over time on the Medidata side.

I think there was a nine-point difference between non-NFRS or non-gaap and gap margins.

Do you expect that delta to remain the same over the next four years?

>> Pascal: Do you want to take this one?

[Laughter]

>> If I understand it correctly.

>> Pascal: There are two questions, I think.

You have the continuing treatment, so clearly we will apply the rules of what we do currently.

So it will be part of the non-IFRS.

And then there is, relative to the policy, I guess, are we continuing to do the same things on what we do, compared to -- because we have a different practice on the way, with people, and the way we, to an extent, we associate the people.

But there is one common pieces, if I may.

If we stick to the plan I just highlighted to you, and with Rouven, the practice would be almost the same than what you did.

>> Tarek: I think we have a track record of attracting very good people and retaining them.

So our regrettable attrition rate globally for a software company is under 4%.

Which is highly unusual.

And that's because of the benefits package that we have, it's because of our pay practics, et cetera.

Obviously, we can't be a special snowflake in Dassault Systemes.

We have to be part of the family.

That's what we signed up for.

But I think there is definitely room for us to continue the practices and benefits that we have in a way that makes sense within the larger family that we are now part of.

So we'll continue -- I think the big focus is to hire the best talent and execute well.

I think that's the focus for everybody on the stage right now.

>> Pascal: We will take one last question.

>> Johnny Brennan here from Credit Suisse.

Just three really quick ones, I'm conscious of time, so they will be quick.

Firstly, just a follow-up on that shared base payment comment, can you just help us from a modeling perspective?

What is your expectation of the 2020 charge for Dassault in share-based payments, including Medidata?

Secondly, we've heard about out scale a few times as a source of synergies.

I can understand how they're sold as a short term utilization problem.

But over the five-year view, can you just remind us of why you're competing against the hyper scalars?

Quite a few of the software companies are going the other way and embracing them.

And lastly, from a software company business model, I don't often hear companies talk about wanting more services.

Most people want to embrace the partners, whether it's a cognizant or an extension.

Can you remind us of the business model, what's the margin profile of services for you, and why not just give it to the SIs?

>> Pascal: Do you want to take the services piece?

>> Tarek: Yeah, let me address the services piece.

So actually services, in the business that we are in, are atypical for most SAAS companies.

The model for a lot of SAAS companies is that they effectively give the services away, zero or negative margins it.

We drive between 35 and 40% margins on our services.

They are an integral part of how the software is delivered and maintained by our customers, and they value it.

We have customers who, many years ago, over a decade ago, implemented Medidata's core EDC platform.

And who maintain services, relationships, with us over that entire time.

So if you look at about half of our services revenue, it's repeat business.

It comes every single year from our customers.

In fact, it's grown over time.

So it's not a commodity service.

Yes, it can be outsourced.

CROs can be an outsourcing partner, some of the SIs can be, but we bring I think a depth of knowledge and understanding that our customers value and they're willing to pay for that.

And it drives I think a very profitable, very well-margined business for us.

We continue to see that growing.

In fact, as we look at what's happening with acorn AI, we see that being able to deliver the technology is very important but having the right service wrapper so you get the value from the technology is something that our customers are looking at.

That's not going to go away overnight.

>> Pascal: For the stock-based compensation's plan for 2020, my recommendation is wait until Feb next year.

Because we are here to discuss the long-term.

It's a capital market day.

It's not an annual objective definitions meeting.

So clearly, we give you the details at that time.

The last question was related to the sales synergy, right?

[Indistinct]

Ah, maybe you can take this one over.

Because you are the guy who has been negotiating with them.

>> Rouven: I think what's underestimated and underappreciated, you create quite some dependency.

Having the ability to offer a highly scalable, and a service that is regional, not just global but also local to where your customers are, is extremely critical.

I think it's going to be a key differentiator.

For us, you can look at us as a small company and a big company.

Our spend with AWS is somewhere between $10 million and 20 million.

That's how far and how precise I can be.

But I also have to say that it's very little compared in terms of business volume.

When you look at our overall business, and customers that we serve, it's only a small part of it that goes through AWS.

When you think about how we are going to scale this out into the future, one of the concerns that we would have is how much money we would have to invest into an AWS in order to bring out of Medidata to these hyper scale companies.

Of course, they're all coming and want our business.

Having options and choices and being able to leverage them is a significant advantage.

>> Bernard: I think my conclusion is we have the best team to serve the market.

Really, I do think this is the most important criteria.

I think we have the best team.

We can truly become a game changer for an industry where we think the needs are there, in every countries.

The timing is right for it.

So that is what we are trying to communicate to you today.

I hope you have seen things that you have never seen anywhere else, in the demonstration.

Everything you have seen are not prototypes.

They are real, existing solutions as we speak.

I think we are going to do it.

Thank you to all of you, and thank you for participating in this event.

[Applause]

>> Pascal: I suggest we continue to discuss around lunch in the cafeteria, if you wish.