Muenchener Rueckversicherungs Gesellschaft AG in Muenchen Investor Day

Company Participants

- Andrew Rear, Gesellschaft Aktiengesellschaft
- Christian Becker-Hussong, Unknown
- Daljitt Barn, Unknown
- Greg M. Barats, CEO & President
- Joachim Wenning, Gesellschaft Aktiengesellschaft
- John Paul Pieper, Unknown
- Karsten Crede, Unknown
- Marcus Winter, Unknown
- Mark Klein, Unknown
- Mary Forrest, Gesellschaft Aktiengesellschaft
- Ritesh Kumar, CEO, MD and Director
- Wolfgang Hauner, Unknown

Other Participants

- Andrew James Ritchie, Partner, Insurance
- Frank Kopfinger, Research Analyst
- Guilhem Horvath, Research Analyst
- Ivan Bokhmat, CEEMEA Banks Analyst
- Jochen Schmitt, Research Analyst
- Kamran Hossain, Analyst
- Nadine Adrienne Marion van der Meulen, Equity Analyst
- Paris Hadjiantonis, Research Analyst
- Roland PfÃ¤nder, Research Analyst
- Samit Patel, Analyst
- Unidentified Participant, Analyst
- Vinit Malhotra, Banca di credito finanziario S.p.A., Research Division
- William Hawkins, MD, Head of European Insurance Research and Senior Analyst

Presentation

Christian Becker-Hussong {BIO 19080254 <GO>}

Good morning, everyone. Welcome to our Investor Day, Munich Re driving digital transformation. Welcome to everybody here in this room. But also a warm welcome to

everybody following this conference on the Internet.

We are delighted to have 11 colleagues with us today, presenting a very wide range of digital businesses throughout Munich Re group. And this is how we would like to organize the day. We have divided -- and let me just quickly show you. We have divided the day into 3 tracks.

Between the second and the third, we will be having an extended lunch break where we will show you, with 4 exhibitions, more of our activities going on in the group, in a sense of a live presentation of these activities. And I will make a separate announcement just before the lunch break and introduce my colleagues to you.

As far as the procedure is concerned, what we will do is we will present, back-to-back, all presentations within each and every track. Then, we will have a joint Q&A afterwards. So we will have, altogether, 3 Q&As. That's basically it as far as the procedure is concerned.

And before we get started, I would like to introduce to you the first 4 colleagues presenting today. I'll start with the Joachim Wenning. I don't have to introduce him to you. Joachim, CEO of Munich Re group. And he will provide you with an overview of the group-wide activities in driving digital transformation.

Mark Klein, he is the Chief Digital Officer of ERGO Group, will talk about ERGO Digital Ventures. Mark Klein has a background in engineering and economics. And he started his career with McKinsey. Afterwards, he joined Vodafone where he held various senior management positions in marketing and sales. Before joining ERGO, Mark worked for Deutsche Telekom where he acted as commercial leader also responsible for the digital transformation. And he became CEO of T-Mobile, the Netherlands, where he implemented a digital culture.

Marcus Winter, Head of Reinsurance Development, overview on digital transformation in the reinsurance group. Since 2013, Marcus has worldwide responsibility for strategy, innovation, data analytics and business development. From launching global innovation labs to driving new business models through data analytics, Marcus and his team are committed to seeking out to drive core growth strategies for the reinsurance group.

Since joining Munich Re in 2002, Marcus has held a broad variety of roles in Munich Re. And from 2005 to 2008, Marcus was based in Sydney with management and results responsibility from Munich Re's nonlife business in Australia, New Zealand and the Pacific Islands.

And last but not least, Wolfgang Hauner. Wolfgang is Chief Data Officer. And he will talk about data and analytics today. Wolfgang worked with the Boston Consulting Group and msg systems as an IT consultant and project manager and also as an actuarial and IT consultant with Employers Re and Audi.

In 2006, he joined Munich Re as Head of Global Reporting with responsibility for implementing a global data warehouse and overseeing the company's global data architecture and data governance. In 2015, he established the data analytics department. And in early 2016, Wolfgang assumed the role of the Chief Data Officer with the overall goal of leveraging knowledge and developing an analytical framework within the group.

So far from my side. And now I have the pleasure to hand it over to Joachim.

Joachim Wenning {BIO 16273429 <GO>}

Thank you very much, Christian. Ladies and gentlemen. Good morning from my side as well to all those here in this room. And also, a good morning to all those who are actually listening and/or watching us through the transmission on our website. I am pretty amazed by how much interest this topic has raised. I'm pretty pleased by the number of attendants here. So thank you for your interest. I'd like to anticipate this already right now.

I hope you enjoyed last night. I understand that around 2/3 of you could make it already last night, start having some discussions, some interesting talks with him some of our experts. And I think some of you also enjoyed virtual reality. But today, you're back in reality. It's the real reality.

We have put quite a lot of effort into preparing this Investor Day for you. And on the positive side, I'd like to say there is a lot that we believe we have to share with you on this topic. And we are proud of this. I'd like to add also, on the negative side, if you may call it like this, we cannot possibly tell you everything and every detail about every initiative because, as you can imagine, this is a public session, right? And I think, there is -- at the other end, there is quite some interest of listening to what we are doing. But there is enough that we have to share with you.

And also, I should anticipate right now that this is not a session to prepare you to fill in your spreadsheets. So this is not meant to translate what we are doing into numbers, whether it's top line or bottom line, 2018, 2019, 2020. This is really meant to show you real insight, a real view into our initiatives, into our workshop activities or into our lab activities. And believe me, some of these initiatives don't even fit into our internal standard understanding or forms of business planning.

So that said, I'll show you my first slide. And my message is, to us, digital transformation simply is a must. 'Simply is a must' means like it's expected by all players. And it's expected by both the private clients. But it's also expected by the corporate clients. And we have seen this in other industries. And here is just some examples that everybody will recognize from other industries.

And the same is going to happen in our industry. Private clients and corporate clients will simply take for granted that also the insurance and the reinsurance player will be digitally transforming.

This slide here, to me, personally, is pretty key. It's pretty key to explain how we are currently thinking. So what you're seeing on the left-hand side is the traditional, the core value drivers of the insurance and of the reinsurance business as we look at them. And on the primary side, this is sales as a driver. This is operations as a driver. On the reinsurance side, it's more tailored products, solutions. It's the risk assessment capability.

And for both reinsurance and primary insurance, it's the investment management competency. These are the 5 key drivers. And you can really nail it down. That's traditional. And how do we look into what we call the digital ingredients. And by digital ingredients, we mean data and technology.

We don't really believe that they are short of a separate standalone value driver. What we believe. And this brings us into the middle part of this picture, we believe that data and technology are levers to sophisticate, to improve the key drivers.

So what does it mean? It means like by using, by implementing, by building in data and technology, we're going to improve our underwriting capabilities. We're going to insure stuff that was uninsurable before. We're going to tailor products in a way that we couldn't tailor them before because now we have a lot of data that we didn't have before.

It would mean, on operations, that we're going to use technology, take our artificial intelligence, which will allow us making operations leaner as we couldn't do that before. And it means, on the safe side, that we will design the front end to the end consumer in a way that customer experience is improving. So this is -- and even on the investment side, you can say you're using algorithms to improve your investment capabilities.

So this is what we mean by this middle part. We're going to use data and technology as a lever to improve our capabilities. And by bringing those capabilities to the market, the question is, is this marketing going to shrink? Or is this market going to grow? And our hypothesis for the time being is that the market is what it is. So it's neither going to shrink or grow globally. But it's going to offer better positioning and better competitive edge to those who do a great job in leveraging data and technology. So maybe, they're going to write higher shares. But the pie as such of the traditional market may look as sizable or as small as it is looking today.

And on the right-hand side, what you see is why we transform the way that we were doing business into how we're going to do business in traditional, other industries have already transformed or are also in the process of transformation.

So take the example of car producers or mobility, take autonomous driving, buzzword, I know. But it's sort of real. Where, in the past and the very traditional way of doing business, insurers and reinsurers would have offered risk coverage to the owners of a car; owner by owner, product by product, policy by policy. This maybe has to change.

When the mobility ecosystem changes in a way that you say no, people aren't owning cars any longer. But maybe the car producers are going to own them or somebody else. They're going to sell mobility to the end consumers. And whether that is cars or trains or

planes or bikes or whatever, drones, who cares, maybe they're going to sell mobility, pay as use. Then the question is, how is the insurers and the reinsurers wanting to position themselves in such a new ecosystem? And you're going to hear more about it. I just wanted to highlight one example that you have an understanding of what that right-hand picture means. It means like by transforming into other transforming industries, we might get the chance or the opportunity to build new markets that we have never seen before. So that is potentially a growth story.

This next slide is a pretty simple slide. I like it because it's simple. But I also like it because it's my slide. What is it meant to provide? It is created for communication and alignment purposes, basically. We use that both internally and externally. And what it means is if you look -- it's like our strategic house, if you want. There is a roof. There is a basis. And there is the floors in the middle. If you look at the basis, it means there are lots of values in there that Munich Re is standing for.

And we say these values have been crucial in an analog world. And we truly believe they're going to be crucial also going forward in a transformed world. So you better don't screw up and damage these values. But keep them as high as possible because they are enablers for everything that you keep up as an ambition.

And on the roof to the upper left, you see that improving and growing the group portfolio, the business portfolio, of course, is a key task, if you like. It is an ongoing task. And you see more about it. Now my message here in this context is you see how important the digital footprint is in this house.

So all this orange or yellowish-orange-colored bullets have a digital background, have a digital component into it. We believe that the digital transformation is a key enabler, is a key differentiator for future business. This is what the slide is saying.

I skip this one. And I come to this slide. What it shows is a global map in the center. It shows a global map. And it shows the global digital footprint for Munich Re. So it shows where do we have a lapse, where do we cooperate with or partner with accelerators like in the Silicon Valley or in Madrid with Mundi Lab, in Beijing, et cetera, where have we built internal incubators. And all of these workspaces or forms of work, they service both internally but also for joint projects that we are running with clients.

It also tells us how many people are dedicated to innovation initiatives. So some 300 people. And most of them, most, fully dedicated to their innovation initiatives. And a pretty large number of those 300 has a concrete data science background.

But it also tells you how much we have invested beyond the people engagement. You see this number to the upper right, more than EUR 150 million (sic) (EUR 160 million) up to now. And you will see how many invest -- how much investments we have undertaken mostly into minority shareholdings with startups that we cooperate on -- that we pilot with. So the number above EUR 50 million (sic) (EUR 60 million) but below EUR 100 million as it stands today.

If you look at this picture that you see it's a pretty busy slide. If you had looked at its three years back, it would have been empty. So sometimes people ask me, are you happy with progress on innovation or on digital transformation? Then I struggle and I think, am I happy? Looking back, I'm very happy. I'm very satisfied. I think what we've achieved is really a lot. But then, when I look forward and you asked the question, do you think that all of this is enough going forward? Then I feel like it will never be enough. So all these numbers, all of this engagement going forward is on the rise. And this is a journey that we are also on.

I'd like to share with you our pipeline statistics. Of 1,000 proposals -- a proposal is like a first idea, let's call it the first idea -- of 1,000 proposals that we have counted, maybe there have been more. But this is what we've centrally counted of.

Of 1,000 proposals worldwide, primary and reinsurance, about 400 have been properly, one by one, assessed, have been properly evaluated for further follow-up or just for exit, about 400. Of the 400, about 200 -- I'm rounding these numbers, it's not an exact science -- about 200 have been approved for testing. Testing a prototype, piloting, experimenting, whatever the word is that you want to use. And of these 220, 130 is ongoing. And of the 130, a little bit more than 20 are in implementation.

'In implementation' mostly means it's in commercialization. And it's in the business scaling up process. There, it's at the -- more at the beginning. So is not way up into the exponential curve. It's at the beginning. So it's quite promising. And of these 20 you see on this slide, some very prominent examples. And I'd like to share with you how we cluster them, what our understanding is, how we differentiate them for a better understanding. On the left-hand side, you see some of the initiatives. And we see a closer link of those initiatives to our traditional business. So in this sense, these initiatives are going to transform and strengthen the core traditional proposition of Munich Re and/or ERGO, whereas, on the right-hand side, you see like totally new propositions, propositions that we never had before.

And in the middle, you see a pack of initiatives where you say there is somehow a mix. It's 50-50. It's, to an extent, traditional. It's, to an extent, completely new. And you're going to hear more about all these initiatives in the course of this day.

My last slide for this introduction wants to say the following: the innovation, ambition -- the innovation space is a synergy potential for primary and reinsurance. When I said in the beginning that leveraging data and technology to improve the key value drivers. And this is true for reinsurance and primary insurance. And by linking all this together, we strengthen the initiatives.

So concrete evidence, we have for the so-called co-creation projects or co-creation agreements with our reinsurance clients. They put their competencies together with our competencies. And we build something together. But what this slide also says is we do the same with ERGO. So -- and this goes beyond just sharing cost for building infrastructure. That's the most obvious stuff. It goes into building new business when it comes to mobility solutions, for example, when it comes to IoT or when it comes to --

there was one more side, or was another one. And you're going to hear more about this in the course of this day.

So I hope you're going to have an excellent day today. I hope you find this exciting. I hope you find this encouraging. I hope you will have many good insights. And I hope you will appreciate that this will be a good Investor Day. Thank you very much for your attention.

I hand over to you, Mark. Thank you.

Mark Klein {BIO 1994583 <GO>}

Thank you very much. Also good morning from my side. As Chief Digital Officer, I'm responsible for the digital transformation of ERGO, the primary insurance business. And to build up new businesses in the digital space. And I believe it's the right timing because we see a few changes happening. We live in a time of exponential technology growth. What you see is that sensors are basically coming more and more into our lives, yes? A smartwatch has 6 sensors already. A smartphone has 14 cases, sensory cases. And a car has around over 100 electronic steering units. And what all these things do, they generate data.

So basically, the worldwide available data, the 90% of the worldwide available data today has been created over the last two years. And this trend is just accelerating. When you combine that with the computing power that we have available, we see that we can really generate a new world. And what you hear there is all the things about artificial intelligence. And these basically enable new business model and help us to transform our business. The time is right to do so.

In order to fully capitalize on that, ERGO has taken a special route to that because we created ERGO Digital Ventures, which is not the classical way. You know the ERGO strategy program was fit, digital and successful. And out of this successful part, 50% of the initiatives are basically driven by Digital Ventures, which is created as a whole business unit, having own revenues and profits in and all the knowledge and capabilities to drive the change within ERGO.

Out of this special position, we basically see a dual mission. The one mission is to really transform ERGO as a company in Germany and worldwide and driving different initiatives to make that happen; on the other hand, driving growth initiatives that are enabled by digital technology. Having a P&L of around EUR 1 billion gross written premiums was ERGO Direkt and all the capabilities onboard to drive new businesses.

In order to do that in a structured way, because when you look at digitalization, digitalization can be everything and can be nothing. You see people talking about EOP implementation as digital. We have given as a sort of framework to give us guidance what we and where we are focusing on.

The fundament of our digital transformation is the digital culture, which we basically drive via an agile way of working and being very transparent of what we do and how we do it in

order to take the employees with us, because at the end, digital is not one silver bullet. These are many initiatives and a kind of culture that basically drives digitalization within a company.

The core and the heart of the 3 business pillars. And on the left-hand side, you see that we use digital technology to improve our current business model, where we say the business is as it is. But we use digital technologies to make that better, more customer-focused. Here, we start with a hybrid customer, the omni-channel approach. Then we also use digital technology to disrupt ourselves. And that is quite a brave move because disrupting yourself is always difficult. But we said, let's enter that, space and for that, we started with nexible, our pure online player. You will hear later on from John Paul Pieper what we have done there and how are we are progressing.

On the right-hand side, we also use digital technologies to create new business models. You also hear from that around ecosystems. And here, we started with the automotive industry. With ERGO Mobility Solution, we basically create new business models together with the ecosystem of the automotive industry. Karsten Crede will later on give you an overview of what is happening there and what we do there.

As a kind of roof, we said this is something like the credo we are pushing. We have to use and implement the new technologies that are available. And when I say implementing, I mean really bringing it to our core processes is the aim.

I've seen a lot of times where you bring it to the lab, we also have said and do that. But you have to challenge, when you implement in the lab that people from the line go there, they say, "Oh, nice, very good." When they come back to their line business, they say, "Yes. That was the lab. This is not the real world." So we really want to use digital technologies and implement them in the real world of all processes.

Starting with the omni-channel, the hybrid customers, you can also call him the modern customers. Why do we do that? Why do we put an effort in that? Well basically, what you see here, the development of the pure online sales in the German market will go up to 25% up to 2020. It is a growth. But it's not tremendous. What you see, nevertheless, is 70 -- in 2020, 75% of all customers will first check out online what the right proposition is. So you have to be there. You have to be present. 50% will basically then buy offline. Only 25% will buy online.

So the large majority of the market is the omni-channel customer, the hybrid customer. And you know it from yourselves when you check it in telecommunications close to 100% checking online and a lot buying offline. So that's why we're tackling that.

What are we doing to be successful? We basically create digital assets that enable us to harvest and to support these customers. On the left-hand side, the first thing we have to create or we are creating a 360-degree customer view, that we know our customers, what product he has with us and how we can cross and up-sell. We put a lot of analytics behind that to make that happen.

Then we create an e-service platform, the Kundenportal, in order that our base customers have a first entry to us as a primary insurance. We are currently developing pretty well with a combined annual growth rate of 35%. Why is this so important? Currently, our customers visit the customer portal 5x a year on average. That is a huge number because these are visiting us, checking their accounts. And it gives us the opportunity to communicate and to offer services and products to our customers. And that is a huge opportunity.

Then on the right-hand side, we are building a platform for the online sales, a product and promotion engine that is pushing that accessible via all devices, being it the smartphone, the tablet or the PC and with a really redesigned concept to get the customer onboard. We also see first results. We have an increase of 22% in the health insurance market because of better conversion rates that we already achieved. And there's a lot to come.

And the fourth digital assets, we are looking at our agents. We are already pretty strong. There was an analysis that we're among the top 3 agents online. With this new technology, we are -- basically enable them to fully participate in the digital world, being present in the 'Net, informing the customers. All these 4 combined give a seamless experience in the sales and in the service to our customers. And that is what they expect at the end from us because other digital players are already providing us. And this service and experience has to come to the insurance industry.

From the technology perspective, in order to implement the technology, we have formed the Digital IT, which is located in Berlin and in Warsaw. In Berlin, we expect to have 50 experts; in Warsaw, 250. Right now, we are round about 120 employees working like a digital factory and providing services for different digital initiatives.

We are prepared to spend EUR 140 million into these digital initiatives. And we basically already start there with a new way of working, fully agile, due to the fact that many of the projects are run in the core of ERGO, this has a transformational effect also on the core of our business.

You see, one example that we're already driving is with ERGO Mobility Solutions where we started to design a front end for the car dealers in order to have a seamless integration into their sales processes. But more and more projects are basically designed in that way. This factory gives us the resources to drive the digital initiatives throughout our company, being it in Germany but also international.

Regarding innovation management, we basically take because a lot of things, as I mentioned, are currently happening. We oriented ourselves at the Gartner's Hype Cycle where we basically look at 3 straight stages. In the very early stage, we basically take the position of observe where we have a look, we understand the technology. But we are not really starting to implement.

In the explore phase, this is basically where innovation management steps in, we drive projects, we test. And we see how the technology is working and functioning. Then in the deploy phase, we basically work very close together with the business, the business is

also bringing the budget with them, in order to implement the different technologies in our processes and in our business systems.

What you see there are the processes that we have already done going for what's implementation, having smart home, I will later on explain a bit more about that, providing cyber securities, we have done the first checks on bots in order to support our call center agents and help them to drive the transformation.

Besides, the German view here is also a very strong exchange with the international colleagues. When you see, you will later on have a presentation from Ritesh Kumar from India, we have basically seen that they are very strong in implementing robotics into their processes. And we basically took that experience and have formed robotics competent center in Germany to basically bring that knowledge to the German market and automate our processes.

Regarding smart home, which is one of the innovation projects we were driving, we partnered up with Deutsche Telekom in order to make it a complete bundle of hardware, software and insurance products. We basically use the technology of Deutsche Telekom. And we wrapped around a service layer of insurance where something is happening in your home, you basically get informed via your smartphone. When you're not available, we, as an insurance, step in, in order to help you to solve a problem.

Is it water in your cellar? We will contact a contact person to go in and basically close the water. When there is a burglary, we basically inform the police. And with that, you have an all-in-one package. And what you see at the end of the day is you will see more and more solutions coming out of the combination of hardware, software and services, which are provided by technology partners together with an insurance.

Overall. And this is my last slide. How do we drive transformation within ERGO? For sure, one of the biggest lever for us is to really transform the core. This is where our revenues are, where our processes are, where many, many people are working.

So we created, outside at the edges of our organization, competencies that help us transform the core because there, you have more freedom. Being at the hybrid customer where we basically build the digital assets at ERGO Direkt, which is a smaller entity. And help venture form the core, being a digital health, together with DKV outside to help transform the health industry, being it HDFC ERGO with all their knowledge on robotics and automation, being it ERGO Mobility Solutions where we're basically outside of the core built up the new ecosystem, or being it nexible, which, from my perspective, is the farthest out to help transforms the core. And we already see that happening.

To give you an example, the risk model we have built with nexible will be basically the future basis for the risk model we're going to use at ERGO. We are looking at the claims processes to basically reimplement that. And this is possible because it's the edges of the organization, you have more freedom. You can act faster. And you have not so much resistance in transforming.

So taking this approach, I'm pretty confident that we are making the right steps into the right direction. Nevertheless, we just started on our journey to be clear about that.

Thank you very much for your attention. I will now hand over to Marcus.

Marcus Winter {BIO 3035598 <GO>}

Thank you, Mark. Thank you, Christian, for the nice introduction. Good morning. I brought something along for you. This is a commercial-grade sensor that was a design by one of our IoT teams, part of Greg's team at HSB. And you will hear more about what we do there later today. And that sensor, I will pass it around in a moment, that measures things like temperature, motion, vibration. You can attach it to a machine. You can learn from the sensor if the machine runs hot. You can learn from that sensor if the machine has a vibration that the sensor doesn't like or doesn't think it's the right vibration of the machine, all of these things.

That is not the typical product that you would expect as part of the offering of a reinsurer. And maybe 2 or three years ago, you have said that is very unusual, to say the least. And I would like to talk to you -- with you about why is it a good idea for us to work on these topics, why is it a good idea for us to work on these topics. I'll pass it around. I promised Joachim who runs the team to give it back to him later today. So or maybe you manage that.

When you look at the topics that we are involved with, they all center around 4 core external major trends. You will hear those trends over and over again today. Technology changes, new risks come up, we have new digital ecosystems and data analytics really are in a revolution. I would like to spend one moment on asking why do we work on these trends?

For us, on the reinsurance side, that is not a top-down decision. There was not smart board meeting or a smart strategy, actually, where we said that's it. We it quite the other way around. We really start from many, many small initiatives throughout the organization, internal ideas, external ideas.

Our whole innovation machine, we talked about this in the previous sessions that you may have heard, that our whole innovation machine with the scouts and the labs and all of that, that is all designed around nurturing and finding and triggering new ideas. Once we have the ideas, we then have a very lean process and a very efficient process because that's run by one of our managers to really invest and to nurture these innovation initiatives and to give them the corporate funding that they needed to make them grow. And if they succeed, they will get more funding. And if they don't succeed, they will -- we will stop them.

And surprisingly, when you look at the initiatives that come up, all of those are in these major fields. So so far, we have not found a major trend that we would have said top-down, that's an important one, that was not -- been addressed by these initiatives from the ground up. And that is very good for us because we then have immediately people

that are engaged in these topics. And we have colleagues that really want to take these topics to the next level. And that is the core reason why we are successful with our innovation initiatives.

Of course, many of those topics have interactions and links. When you talk about IoT, you have to have data analytics. And we're going to look at cyber and the services that are around the cyber products. You need to have information about your exposures. You will add service components. You will work with digital ecosystems. So it's not a distinct set of initiatives.

But now as we have the initiatives coming out in these different buckets, you can now start to link. And we learn from each other. And we get very good at connecting the different dots. You will hear more about cyber later today. You will hear more about IoT. You will hear much more about all the other system -- things, digital ecosystems, data analytics and so forth.

Core message from my side, we do it more bottom-up rather than top-down. Of course, once they have a certain size, once they have a certain significance, we then start to also bring in top-down views and start to measure and to push them in the right direction.

A few years ago, for us, insurance was more described as a fine-tuned machine, also on the reinsurance side. We started -- we tried to build up internal expertise. We brought capacities in-house to compete with other similar companies for known customer groups. That does not work anymore, at least not for us on the reinsurance side.

We see that the customer bases are changing. We now work -- in addition to the cedents, we work with different customer groups, large corporates, small startups, digital ecosystems and the like. We see that competitors come out of unexpected areas. Again, startups but also large incumbents, large technology companies. And we see that it's -- there's no way that we can really be fast enough and good enough in building up all the expertise in-house. That would be an ambition that is not achievable. So that's why we consciously decided let's more look into working in networks, let's design our processes in a way that we can bring in external partners.

That can be tech startups. Tech startups, in many cases, help us to improve our own products. When it comes to IoT, for example, or to cyber, tech companies can help us. On the other way around, we can help them as well. We can take away some of the risks that are attached to their products. We can help them with distribution.

Same is on the insure tech side, same game. We have digital ecosystems out there, vendors, brokers, digital MGAs, all of that. And they can help us to distribute our products. And we can help them to get around the red tape, if they want to get into new markets.

We have large corporates. We can help them to innovate around a risk topics. And again, they can be important clients for as. And we have examples for all of these areas. And that only works in networks. If we try to build up all the cyber, AI technology, whatever expertise is out there, in-house, that will take a long time. And by the time we are

finished, the developments would have moved on. And then the next round of startups and the next round of new ideas would have to be replaced. So we really believe in networks and partnerships work and a very different way, much more in a flexible and modular system rather than this fine-tuned machine on the reinsurance.

Of course, it's a cultural change, the cultural shift. And one of the benefits that we see, because we have the labs, because we have the teams that go out to these labs for certain sprints, when they come back and do their day-to-day business, they also do that in a different way. We also see that when we set up the first rounds of scouts, we deliberately send out senior executives to Silicon Valley, experienced people to Tel Aviv. Because when they come back after 1 or 2 or three years, they help us to really change how we operate in the traditional business internally. So that cultural change really gets tangible now.

So if you say we have the right topics, the question is, why us? Why are we in a good position to work on these innovation topics? You know about our global presence, our existing markets. You know about our global financial strength. We see more and more that it's a good positioning for us to have a full range of monetization options available.

Irrespective of whether it's primary paper, technology, reinsurance paper, understanding about around risk topics, whatever, we have all the ingredients that you need to monetize most of the cases that we see out there. We have no IT legacy on the reinsurance side. We simply don't have enough clients and contracts per year in a reinsurance relationship to really mess up our systems over long time. It is all very lean. And we have invested a lot of money in the last 10 years to have global standards there. And that works very smoothly so there's no IT legacy.

We have virtually no channel conflicts. We do have, at times, of course, topics where we have business units that cover similar areas. But these are only very few that really have these conflicting content. In most areas, we have no channel conflicts. So for startups, for incumbents that one to do new business, for large corporations that want to get into that space, we can offer swift solutions without stepping on the toes of our business units and other areas.

When we went to the Silicon Valley, the question was, why would they -- in the first place, why would the startups, why would they -- would the innovation ecosystem even talk with us? Why would they be interested in? And we said, "We don't know. We just test it."

So we went there and realized that the innovation ecosystems out there, they are very interested in partnering with us because what they appreciate is our domain expertise in underwriting, in risk management, in claims and so forth. What the innovation companies -- innovative companies, small and large, bring? Typically, it's technical expertise. What we bring is a thorough understanding of risks.

What we also give is we have a very efficient access to new solutions. So when we have a good idea in one part of the world, take it cyber, one service component that is developed in one part and for one market, we can easily transfer it into other areas. We

can also use our existing network, our existing distribution network on the reinsurance side to push new ideas globally. And that is much appreciated by most of the partners that we deal with.

We have a strong brand. Trust is very important. It has been built up over the last years, significantly, also in this innovation system. And last. But not least, the longevity of our offerings. More and more seems to be a competitive advantage.

We come across a number of startups or new ideas that then are acquired by another company. We had one prominent example last year that was an AI company that was bought by another company. And the day after they shut down their service. They said, "That's in competition to what our new owners do. So we just stopped our service." And if you rely on new technologies, if you work with new things, that's, of course, the very thing that can happen to you.

So what we offer in all what we do, we label. If it's a pilot, we said -- we tell our customers that is just a testing environment. And we test. But once it's up and running, they can rely on us providing that service in the pre-agreed framework, which is a very important asset to have in that space.

Joachim mentioned we also do invest. That comes back to the question why companies talk to us in the Silicon Valley. The first round of discussions that we had internally was if you go to the Silicon Valley or Tel Aviv, you have to have a large checkbook. They said, if you don't offer a 3%, 4%, 5% participation in the startup company, they will not talk to us, they will not engage in -- because the only thing that they're interested in is money.

And we found out that's not true. We found out that we can engage with companies, we can engage with partners and set up really cool new business models together. Then, once we like the development of these interactions, once like the projects, once we understand the business people and see that there is tangible value, then, we also negotiate and talk about a partnering in a financial way. Then we invest. And we did a few investments in our core areas of expertise with companies who we really have a working relationship that is already very close.

So what does it mean for our overall setup? I hear many questions around is it reinsurance that we should focus on? Or is it innovation that we should focus on? What is better, reinsurance or innovation? People that ask me from the outside around this topic, usually, they say something like, "Reinsurance is a shrinking business environment. So you now use innovation to do something new." Or they say the other way around, "Reinsurance now, with all the losses and potential change in the cycle, that is now producing all the profits, do you still need the innovation at all?" And that differentiation between our core business and innovation is fundamentally wrong. It's not about reinsurance or innovation. It's about reinsurance and special primary insurance that we do and innovation.

The combination really is key for us. I fundamentally believe that the profit pool that have from the traditional reinsurance side, that they will stay because the world is getting riskier as we speak. At an individual level, at the level of commercial entities, at a regional level,

at a global level, no matter where you look, we see more risks coming up. Some of them are driven by technology. Some of them are driven by political changes. Some of them are driven by the way how we work together globally and how we establish and define our production processes.

So the world is getting more complex and more risky. And people want to transfer more risks to somebody else. We see more and more business cases where people start to say, "I would like to get rid of a particular type of risk." So I fundamentally believe that traditional risk transfer components will stay.

Traditional reinsurance is the core. And it will enormously benefit from the various innovation initiatives that we have. Because when you look at the risks like cyber, when you look at risks that come around -- come out of the new production processes around industrial IoT, when you look at the risks that are out there with the supply chains that get more and more automated and interconnected, that will be a good spot for us. And it will absolutely require us to be on the forefront of the innovation topics.

Because if you don't really understand what's going on in cyber, if you don't really understand what's the industrial IoT does and if you don't really understand how these supply chains work, you will have a problem on the traditional side. And that's where many of our innovations really help us to grow and prosper in that area.

We also help in many areas our cedents to set up their own innovation infrastructure. We have discussions around our experience with them setting up scouts and labs. We also diversify in a way that you don't have to set up your own labs and your own infrastructure. As an insurance company, you can get access to information that, for example, we provide an access to the ecosystem at large.

But it's not just the traditional business, of course, that we focus on. There's a second very important part for us. And that is to create new strategic options out of this innovation space. You see on this slide that this -- that we, again, trying to group, same as Mark and Joachim, to share how we balance between the different areas and where we see the maturity and the distance of the core of the various options. All the things that you see on that slide are in place. So it's not just an idea. For all of them, at least to have solid pilot cases that have proven that we can do successful business in these areas.

We talked about capital market solutions in the past. That, of course, is a core component. And it will help us with some of the growth that's closer to the core. That's not a core focus today. You will hear about the new digital platform in Canada and the digital partners when we talk about reshuffling the value chain, still being pretty close to the core insurance transactions.

We then talk about expanding the boundaries of insurability. So we very successfully launched a pandemic steam. When I was on the underwriting side, 10, 15 years ago, pandemics was an absolute must exclusion. We just could not provide cover for pandemics. And now we have a team that tries to sell pandemics products.

So that is really a transfer on how we deal with that risk. And that is possible because we have different ways of offloading the risk to the capital markets. And we have more expertise in assessing the risk because we partner with a startup company in California.

Then we have the topics of cyber. And Daljitt Barn will talk about this in detail. Then we have more the real data-driven topics that are a bit further out, maybe try to monetize on our insights. I'm not so sure that this label of 'data is the new oil' is true in each and every case.

In many areas, we can replace a certain set of data by just using another one. You can replace the traditional way of underwriting motor by looking at the driver score, maybe or other components. That's not perfect. But there is some replacement between the data.

So the value of the data itself is not clear. That is -- it will be huge. But the insights derived out of this data, the ability to combine different sets of data and come up with new insights, that's the real value. And that's what we want to monetize in there.

And of course, AI on the far out part. That is one of the core areas. And Wolfgang will talk about this in a moment. That's the brave new world where we really can have the machines supporting us significantly in what we do.

So I hope that I got the message across, why it's a good idea for us to work on these topics. And I'm very much looking forward to having the discussion later on. Thank you.

Wolfgang Hauner

So we already heard a lot about data and Internet of Things and a lot of technology coming in. I want to give you some context why this is really important for us, why it matters. And why we need to work on it.

So on the left-hand side, you see a large number. This is a 40 zetta, there's a number. And as a mathematician, I like numbers. 43 zetta, actually, is a projection of the overall data volume for the whole world in the year 2020. And we heard from Mark that 90% of the data was coming in the last two years. And that is mainly because machines are now talking to each other and producing a lot of data. In addition, we see new data types that get more relevant like pictures or videos, sometimes even the analysis of voice data is important.

So we're getting much more data in. But not all of it is relevant. So it's really huge. But to find the relevant pieces, to get information out of the data is difficult. And here, new methods help us. And this was a topic about artificial intelligence that Marcus was already mentioning. So when we look back about 20 years, then the game of chess was over. And nobody would call this today artificial intelligence, because this was purely rule-based, the machine could simply calculate much faster than a human being.

In 2011, that changed a little bit with IBM winning the Jeopardy! against a human. So we had some cognitive elements in there. It was not purely rule-based and last year, it was even the next level that the machine trained itself to win the game of Go. Google was very famous with that and you may have heard that recently, a few weeks ago, they were even beating themselves again with a newer version of this machine. And it was that much better that it had beaten the old machine 100 to 0. And this was just one year later.

So there's a lot of development in the methodology area and we, as an insurance company, just want to make use of it. So that's this picture over here, where we use the functionality that gets produced by the Big Data companies like Google, Facebook, Microsoft and the open source community, where we have products like R and Python that we also use. We take that functionality. And enrich it with our insurance specific data, train it with that data. And by that, create insurance-specific functionality. And we can then use this functionality in all of our insurance processes.

And we use it for our own purposes. So we want to make the work of all of our employees better. But of course we also want to provide it to our clients and provide them with services that have better quality and have faster delivery than we had before.

To do this, it's very important to have the right people on board. So we are having data scientists, data engineers and the key is also to have them work together with the business experts. So only a data scientist would also not help, we need the business expertise to be partnered with the technical expertise.

So data analytics is really vital for the whole group. We've heard that before. So we're using it within the group, of course, for the primary insurance in -- at ERGO for P&C life and particularly do data analytics and health. We use in the whole reinsurance group, centrally here in Munich. But also in the international organization, again in all lines of business. Here we put Hartford Steam Boiler up and particular in the IoT area, we will hear much more later from Greg Barats. And also we use it even in the asset management area, where we also use artificial intelligence already for the portfolio optimization.

And most important, we use it for our clients. We want to generate a better business value and here it's about analyzing client portfolio data, identifying weak spots, helping them to find loss drivers and also to work on customer retention, reduce churn rates, that's the important project that we're doing with our clients.

Where we do it? Basically, in all processes of the insurance or reinsurance value chain. Most important, is in the distribution area. Here it's mainly about those cases that we could not do economically useful in the past, because of high costs, here it's about low volume, high frequency cases where you can use machines to take over some parts that formerly humans had to do. And by that it's getting much cheaper to work on those cases and they get profitable.

In underwriting, this is more about improving the workflow. But also improving the quality and the precision. So that's also a lot about understanding the risks better. And in claims, it's not about faster responses. And again, about more precision in the assessment of the

claim and learning more and faster about how claims are evolving. And we have, also, in the afternoon, some examples on that. For example, The Box project, we will present you a little bit later in more detail.

How it works in the reinsurance? To work on the data and analytics, it's a very simple process. So basically, it's 4 steps. The first one is pretty trivial. First, we have to collect the data. And here, it's our own Munich Re data that we've been collecting for many decades. But of course it's also data that we're receiving from our clients for further analysis and this is a growing area, we use much more external data sources, that means data from the Internet. But also data that we get from data aggregators for further analysis.

Then it's key, really, to structure the data and store it and a vehicle we use here is our group wide data lake. So we put in the data, put all the metadata information in catalogs and that get transparency, which data do we have on which topics, who use this data before and even to an extent where we can see, which queries have been run on the data and how useful were they.

The next type, then, is analyzing the data. Here it's about applying the right methods. So this is about machine learning, it's also a classical, statistical methodology that we're applying and then in the fourth step, it's, of course, action on the insights that we've been getting out of the analysis. So this is really then about improving efficiency, improving quality, for example, on the customer portfolio data and it's also on generating new business.

So looking into more detail in the 4 steps, what you see on the right-hand side is our 2017 IT trend with a correlation map. So in the inner circle you see the main trends like digitalization, Internet of Things. And we're working heavily on all of these main trends and on the outer circle, you see related sub-trends. So these are more of these special topics. And we are also active, more or less, in all of these topics. Not in the same degree. So some we do more, some we do less. But we are doing basically, activities in all areas and here we are collecting the data.

Then it's about structuring the data so for which purposes do we need it. So that could be geospatial data, it can be weather data, streaming data from sensors and we are adding our domain-specific expertise to these data areas. So this is really, then, bringing the actuarial science to this data, having the risk management people working on the data, we have supply chain experts, who then look at the data and try to make sense of it.

The way we do it is, we bring the data into a central data lake. And here we have an open enterprise approach for the whole reinsurance group globally, that means every employee has access to this data lake, not so all the data. So we have different level of authorization in place. And here it's possible that the data gets shared.

People can look into what data is available. By that we can enable very fast product typing, because you don't even have to start in the first step to looking for data and cleansing it and quality assuring the data, it's already there.

So it's a very easy access. It's a self-service functionality and also, we have a lot of compute power in this data. Like it's not just about the data, it's also about having a lot of CPUs and a lot of storage available that people don't have to care about the technical piece of doing all this.

And to structure it, it's technology layer that we're having at the beginning. So this needs to be there, then we bring the data in, we're adding logic centrally to the data. So this, for example, logic to bring data sources together to match keys of various data sources and make it a combined data source. And of course, it's also about having an easy user interface that the people can consume that data later on.

And the technology we are using is various -- for various reasons. So the basis is a Hadoop cluster that allows us a very cost-efficient implementation, as this is open source. And it's very cheap storage in the first step. But sometimes you need high computation power, that's where we use SAP Hana, it's a very powerful in-memory technology. And we're using a SaaS high-performance analytics platform across the data lake and here we have a very close proximity between the data and the analytical functionality, where we can analyze all of the data in the data lake and again, this analytics platform is open to use for any employee in the reinsurance group.

And by that, we're providing to our people the necessary analytics tools, very powerful tools. The access to the data and also very short time to make use of it.

Finally, you have to use it. And that's why people get tools, for example, to visualize the data in the first step. So really to get a first overview like getting correlation maps, heat maps on the data. Then, if you got this first understanding of the data, it's about getting the meaning. So what is the importance of certain factors. For example, here we use classical statistical approaches like multivariable defect analysis. But also regression models and machine learning models to identify the important drivers within the data and of course, the goal is, in most cases to come up with predictive models, not just to look backwards but also to look in the future. And here, again, we're using the newest available methods and we have we have pretty well skilled people who are able to work with that.

And that is all true for the structured data. As I said in the beginning, a lot of the data we're getting is unstructured. So we have a lot of text data, we have pictures, here we need different methods, again, machine learning and artificial intelligence helps a lot to get a meaning out of millions of text documents, for example. Or to identify damaged houses on pictures.

So here it's really about bringing the new methods and making sense of it. How we do this? I have 2 examples here. Is, for example, in the area of digitally augmented underwriting. So not replacing the underwriter. But making certain steps that are currently pretty hard, easier. And also improving the quality at the same time.

So here, for example, in the tariff calculation, traditionally you would use generalized linear models, GLNs, to calculate the tariff and this is very cumbersome. And needs a lot of

expertise to do so. We are taking a different approach by using the client's portfolio data, adding Munich Re data, adding external data, by that, enhancing the data set so it's more information. But then you also need to come up with a new model. The old model doesn't fit anymore.

And here the machine learning steps in. So we let the machine decide what is the optimal model in this case. And what are the real drivers in your portfolio, given that we added information. And that process we can do even automatically once we set it up once. And by that we can recalculate much faster. And that brings us more speed in the process and also it's bringing the costs down because we have less human interaction, we let the machine do the heavy lifting of the calculation. And also it's improving the quality. We're getting more insights on what really is driving the losses in a certain portfolio and use this for tariff calculation.

A second example is to generate business. Here it's about cross-selling. And this example you can think of a little bit as an approach, like Amazon is doing when they're giving recommendations. So they say customers who bought this, also bought that. And here it's also about analyzing your own portfolio than identifying which people did actually buy one of your products and try to derive some reasons for it, then in the second step, you look again into the portfolio and try to identify those people who have the similar characteristics. But did not yet buy the product and then provide these subgroups with a probability and there's a score of buying propensity. And come up with a model that clusters your existing portfolio according to the likelihood that certain people will buy a new product that you offer.

And you can see here, a result of such an exercise where we were geo-coding a portfolio of an insurance company, obviously in Germany. And here we were analyzing a certain product that people have bought. And came up with those scores and then visualize those. And as you can see in the most Western region there's a very highly likelihood that people will still need this product.

And here, we can really improve transparency now for our clients. Where actually are these potentials? Where is a high probability to make us more efficient, have a better client relationship? We can actually also identify the right sales channel though, whether you call them, visit the client or do a mailing campaign, all that can be analyzed and optimized. And by that, we also help our cedents to grow their business and make better business decisions.

With that, come to the end. And thank you very much for your attention.

Christian Becker-Hussong {BIO 19080254 <GO>}

So thank you, colleagues, for your presentation. Now I'd like to open the floor for first-round of Q&A.

Please, who is first? (Michael), please.

Questions And Answers

Q - Unidentified Participant

Just going through your -- so where do these costs appear in the profit and loss account of all these activities? And if I think about the progress, I'm visualizing it like a J-curve. So you're investing upfront, you probably don't have much revenues today. When would we expect to see revenues out of all this? When would we get the kind of exponential leverage or whatever? Then, yes, those would be...

A - Wolfgang Hauner

Let me take this. And give you a high-level answer to this. So where does -- do all these costs occur? They, in the end, they occur in the admin costs, all right? They appear in the admin cost and do we break them down on all of the units? So do we allocate them and charge them to the units? That we don't do, because we don't want to punish those who make these investments. but in the end, they're on the admin costs of the P&L. Second question, this J-curve question. You're right, an initiative will have a J-form shape. The question is, do we have additional J-curves or is like an old J-curve sort of transforming into a new J-curve. And how does that look, then? Believe it or not, I firmly believe that it is a mix. Sometimes, if you recall my picture, right? This one, on the right hand answer, we said you changed your proposition completely and totally by transforming into other industries. That mobility example. If you take that, that would be an initiative where they say, that's a new J-curve. However, if you do a new way of underwriting a business, this replaces the old way of underwriting by a new way of underwriting. And the outcome of this may be pretty much the same outcome, if you like. But just -- you are in the market. And you would no longer be in the market if you hadn't transformed.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Kamran, please. Sorry. Please, yes.

A - Mark Klein {BIO 1994583 <GO>}

Maybe one thing to add. And you see that in the ESP, it is a big investment case. And you know the overall numbers. When I look at investments like nexible, you see the gross written premiums coming pretty fast. So basically this is one-year time. The profits for sure will take a bit longer. So I think with most of the initiatives we are driving in the digital space, you need a certain incubation time of I would say one year. And then you'll see the first effects. Profitability is coming later. And the next thing is, what I always sense, there is the expectation that everything becomes big within three years. This is not necessarily the case. So you need longer times to build it up and it's a for sure an investment in the future. But you need to track it on the way that is taking. So to say, the right direction. Now because (growth) initiatives in the company that is of such a size as Munich Re, at the beginning will always look small. But it has the potential to really grow and build a new future in the long term. And that's why the investment is now.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

okay. Kamran, please.

Q - Kamran Hossain {BIO 17666412 <GO>}

With, I guess, what you know at the moment around innovation, what you've seen going on over the last few years, do you think that's great potential of innovation, to have an impact in, I guess B2B or B2C? So I guess primary or reinsurance? And if the answer's primary, do you actually expect the shape of the (inaudible) over time?

A - Christian Becker-Hussong {BIO 19080254 <GO>}

So that's a very big question.

A - Joachim Wenning {BIO 16273429 <GO>}

I see potential in both, right? And I could even add, it's not only B2B. It's B2B2C but it's also B2C. And by the way it's also B2D or D2C, sorry it's not -- it's D2C. I would differentiate these types of business by speed. So I think the more front-end loaded these initiatives are. So targeting really directly the end-consumer, the more you are as an investor sort of independent from others doing their job because you can do it and bring it directly to the market. These are the fastest, what so -- if you take nexible, it's the perfect example of -- it's directly to consumer, it's pure online and they aren't dependent from anybody else, if they want to be fast, they can be fast. If they want to be slow, they can be slow. That's different if you incorporate B2B, because then you have a corporation partner in that. And you need to sort align the speeds and you cannot -- one party cannot possibly push the speed more than the other counter-parties responsible to it.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Okay, Kamran? Vinit and then Frank.

Q - Vinit Malhotra {BIO 16184491 <GO>}

So Vinit, from Mediobanca. Just on the Slide 41 of the last presentation. You said that it was digital augmented underwriting. When you spoke, it looked like you'd eliminated the underwriter. So it was not very clear what was going on there because is there -- and I know there's competition concerns. But is there any evidence that certain policies or certain decisions were made, which were actually better because -- or you expect them to be better because of eliminating the human being in that process? That's my first question. Second question is the, I'm bit confused on the numbers, I mean, the balance of power is on your side or the technology companies? Because when a house gets flooded, no app saves or cleans up. So I mean, when you go to Silicon Valley and say, we need you, I'm not even sure that, that's true. I mean, does -- I'm not even sure any of the changes you mention happen in reinsurance today. So if you could just comment a bit about this balance of power versus technology companies that would be great.

A - Mark Klein {BIO 1994583 <GO>}

So to your first question, I was referring to the improvement of the technical loss, whereas a complete tariff includes a lot of other components as well, though. You have to add your own costs, you have to add the profit margin and lot of other components, which is not a fully automatic process. That's why, I was saying this gets augmented and to your question, yes, there is evidence that we can improve the quality by machine learning

because we can model the nonlinearity in the data much better using machine learning, where we have enough data to do so, compared to the classical statistical models, which assume an underlying distribution of the data. So that's why we can get more precise. And to the second question, regarding the losses. Here technology can help to identify, in particular, in the area of natural catastrophes, what actually has been damaged. So we can, for example, use aerial imaging to identify the destroyed houses after an earthquake, or identify the flooded areas like we've seen after Hurricane Harvey. And by that, enable a faster loss adjustment and by that, helping the people.

A - Marcus Winter {BIO 3035598 <GO>}

And if I may add on your question to whether we bring anything of value to companies that came out with us in the Silicon Valley or in other innovation areas, our experience is, yes. We see that many ideas center around availability of data, also in this case. But in many areas, if you move beyond really large numbers of very homogenous transactions, the insights, the risk expertise and the understanding of the dynamics of the markets and the risk is absolutely of value. So in the core -- in these core areas, we are very much sold off the partners, also for the large companies that want to move in there, in particular the large ones, they prefer, apparently to corporate with a large entities on the risk management side as well. And so that there is a good balance. And we have a number of examples that we can maybe, take it off-line and go into more detail what we do there.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Frank, please. And then William.

Q - Frank Kopfinger {BIO 16342277 <GO>}

It's Frank from Deutsche Bank. I would like to dig deeper into your strategy in respect to the startups in the insure techs. So you mentioned you have more than 10 investments currently, invested more than EUR 60 million. Do you have some sort of budget in mind that you would like to allocate into the insure tech space and also with this, I think it's related. Obviously, you invested in the early phase. So there might be fundings so the EUR 60 million might not be the only EUR 60 million, it might require more capital to invest. Could you also elaborate on what the EUR 60 million will be, maybe in the future? Then the second -- flip side of this, I think, is not only capital investments, it's only that you provide reinsurance capacity, not only to these companies but only to 2 other insure techs, maybe can also give a bigger picture on, to how many insure techs you provide the reinsurance capacity and how much this is?

A - Joachim Wenning {BIO 16273429 <GO>}

Yes, let me take this question, please. So is there a budget that we have defined? A budget in the sense we have to spend the money? No. Is there a budget understanding in the sense that we say "If we find good investment opportunities, we're absolutely willing to make these investments?" Yes. And we are communicating this into the venture capital community by saying it's easily thinkable that we could do EUR 0.5 billion -- EUR 0.25 billion, frankly, we could do more, it has to be meaningful to us.

Now meaningful, what does it mean? It has to serve a strategic purpose and one is, either we cooperate or buy a minority share, a startup. And then we buy just competency, just abilities, just human know-how or technology into us, with no business expectation as such. And we have seen such examples. And the other one is that we say these startups, they have a front-end access, they target their target group and they have a front-end platform. But they don't have insurance on it and then we extend our market reach by cooperating with them, through cooperation or minority shares, plugging in our risk propositions into their platform. That is pretty much what Andy Rear is going to tell you about digital partners later in the day.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Maybe on the reinsurance capacity, other -- whether it comes also in...

A - Joachim Wenning {BIO 16273429 <GO>}

If I think it's true, I hope I don't miss maybe one investment, there is no capacity limit to this. So what we do with the startups is not really eating up capacity. The capacity limit that we have to consider is on the cyber side. But all the others aren't.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Okay? Was it, William. And then (Sinon), please.

Q - William Hawkins {BIO 1822411 <GO>}

The 200-odd innovation projects and pilots that you referred to, if we take that as a sensible starting point. Could you just give us roughly your guide of how that breaks down between what you been doing on the reinsurance and the primary side? Then also, your counter-parties, if there are any, how many those have been with incumbent insurers or startups or people from just outside the industry, industrial companies or whatever?

A - Joachim Wenning {BIO 16273429 <GO>}

Good question. So I start with the reinsurance side. You can roughly split that into, I would -- it's a bit a guess, I'm looking at (raw), that was my latest knowledge, because I have made out the statistics. I thought like, at least 2/3 would be reinsurance and 1/3 of them. That's a rough estimate, right? Don't take me too precisely. Of the 2/3 of reinsurance, how much is with incumbent clients and how much of that is with new type of clients or startup clients? My rough guess, I don't have the statistics before me. My rough guess, it would be like 50-50-ish.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

(Sinon), please.

Q - Unidentified Participant

Just a big picture question. A lot of these investments are to make you better, in terms of reinsurance for instance, underwriting, administration, operating efficiencies. In terms of the return profile of the reinsurance business, over time, do you expect that these

investments will change that? Because, I guess barriers to entry, are possibly going out because of the large investment that incumbents have to make in insure tech technology et cetera, or do you think that this is purely just to stand still and it's probably, if I look five years down the road, the return profile in reinsurance is probably not to be materially different to what it is now?

A - Marcus Winter {BIO 3035598 <GO>}

So it depends. I have a personal guess. But we're going to see if that's going to happen. I think the return profile is potentially shifting as we digitally transform. It is shifting from pure capacity or mainly capacity-driven into providing, let's call it, coverages, services solution that get a more stable income because of a high stickiness to the business than the traditional capacity-driven reinsurance businesses. This is what I would expect over time. If you then ask, do I believe that reinsurers, as such, over time going to benefit more or less or just going to keep their market share in total? It depends, again. For us, I believe that we see that with regard to the new players, the new startup, we're highly attractive. And I wouldn't say this is reinsurance in general. I see us highly attractive. Some parts have been mentioned already and that is luckily, that we don't have any channel conflict. We would have that on the ERGO side, if you like, theoretically. But it doesn't hurt as Mark pointed out. That we don't have it on the reinsurance side. We don't have any IT legacy issues that would limit us in what we want to launch as new staff. And then there is all this trusted brand, long-term investment approach from ours, the domain knowledge that is highly appreciated. So any development that we'll come across, in cooperation with new players, new startups, I think we are well-positioned and should, over time, be to our benefit.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

There was a question from Jochen Schmitt, then Andrew.

Q - Jochen Schmitt {BIO 4227302 <GO>}

Jochen Schmitt, Metzler. I have two questions on Slide 16, please. First of all, is this in terms of premiums written or in terms -- or in number of policies? And second, what makes you hesitant not to expect the figure of greater than 25% for pure online insurance sales by 2020?

A - Mark Klein {BIO 1994583 <GO>}

Right. First of all, the, these are number of customers that are counted in terms of market research. If you would ask me now, is 25% really the limit? I'm not sure. These were the latest numbers we had. I believe that both the search online and potentially even the sales online will basically further increase. But this is crystal ball. So we see right now that the online market is still growing. So aggregators are growing and the direct online sales is growing. We see it also in our own numbers. So it might be faster. But that were the last estimates. So to say, we got in the kind of official study. Where it's also, I think that 75% might also go up as I've told you in other industries, it's right now, 98%. People are used to search online first, look around. But then buy offline. That is still. And their belief that it's still strong and also a dominant piece of the market. So I'm not expecting online to go up

to 50%. I think that the research online, purchase offline is one of the dominant fields we see up to 2020.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Andrew, please.

Q - Andrew James Ritchie {BIO 18731996 <GO>}

Couple of questions. Mark, unlike your reinsurance colleagues, you have legacy systems, significant legacy systems. Can you just bring us up-to-date as to how you've managed to improve the front-end by dealing still with talking to the back-end and how much of a barrier it has been dealing with those? For Joachim, incentivization and payment, you've got a lot of people looking at new projects in the group. How are you keeping them in the group as opposed to going off to Silicon Valley? Is there a sort of new incentivization structure, specifically tied to new business ideas? The final question, I think, is for Marcus. How do you work with some of these big new, noninsurance competitors and balance between? They may just be using you as a means of gaining knowledge. I mean there's been a lot of press reports about one very large online retailer who is now putting new efforts into entering insurance. And I believe you've worked with them in the past. How do you balance that? Working with them, hopefully tying them in, versus them just saying two years down the line, we'll give you a bit of reinsurance. But actually most of the value add, we're going to keep.

A - Mark Klein {BIO 1994583 <GO>}

I would start with the first one. Well for sure, legacy is a challenge. And we see that. It is part of our IT transformation journey. And to give you one concrete example, what we do with hybrid customer is basically building a new platform that is transforming our legacy, our databases. So we have created really a new database, which gives us the 360-degree customer view. With that one, we basically get rid of older databases. And that's the aim. On the other hand, we have some speedboats, that we really decided to build next to the organization. So when I look at nexible, that is really a greenfield IT approach, with a new IT supplier, that didn't have to source in-house and with that, we're going to drive it. So the closer, when you remember my picture at the end, the closer we are to the core, the more we use these kinds of initiatives to also do our legacy transformation and that has to go hand-in-hand. That's why, we have different investment buckets. The closer you are to the core, the bigger the buckets are, because there's transformational work. And your IT brought to it. And for sure, the time lines are on different speeds. While nexible, fully greenfield, is extremely fast, we are a bit slower with hybrid customer. Nevertheless, it helps us to transform our core, which we have to do, because we are not a greenfield operation. Does that answer your question?

Q - Andrew James Ritchie {BIO 18731996 <GO>}

Yes, I guess I'm worried that -- I mean, I've seen other insurance companies do this. And old customers get lost, because you're in between -- they're not nexible customers, they're old customers and they're (not especially) causing service levels to decline.

A - Mark Klein {BIO 1994583 <GO>}

That's why, when you look at the new platform, the new database is created, are basically with the old customers in. And then we transform with it, our legacy systems. Based on the bigger initiatives closer to the core. And we honestly, we cannot afford to let our old customers fall. Much too many, much too important to do so. And we are fully aware of that. So for me, nexible is really an experiment with a lot of potential. But the core is the core. And we also have to work on that. Pretty clear.

A - Joachim Wenning {BIO 16273429 <GO>}

So I think that your second question, with regard to how do we incentivize people, how do we incentivize the businesses working on innovation. First of all, we have had all of these discussions internally, right? Going whether the current incentivization is like the most appropriate one to encourage innovation as best as possible. We have had all of that. What is the outcome of all of these discussions? For the time being. And broadly speaking, we haven't changed incentivization. In a sense, it's kept both in terms of whether it's level, its structural incentives is the same as it was before, broadly there is individual differences. Why is that? Because for the time being, we have said "We don't see that this would -- should use anything, or bring anything that we wouldn't get otherwise." What we do, though is, where we have people working 100% on innovation, we of course don't incentivize them on their old business that they're no longer looking after. So in this sense, they get freed up for the innovation initiative only. You could argue then, "okay, you might lose the best of your people going forward. And if that's not happened yet, it's going to happen." Is a potential danger. We have seen some, very few turnovers already from people working on innovation and the good thing about that is, they are very key when it gets to kicking off an initiative. So starting really from scratch, you start one individual, then it's 2 individuals, 3 individuals. And they are key, then. But then the initiative still is small. As it is growing, you see that this initiative, sort of, is getting based into the organization. And the organization becomes less dependent from one individual. So in the few cases where we have seen turnover, the initiatives have kept going. So this gives us confidence that incentivization-wise, we are on a good path.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Maybe I think there was a third topic.

A - Marcus Winter {BIO 3035598 <GO>}

When you look at the structure of large companies going into the insurance phase, you would expect in, at least in what we see in Europe and in the U.S., to start on the, first Allianz space, that's motor, that's warranty attachments to products, that's maybe home and content ideas. That typically is not reinsured. So we're not a reinsurer of small insurance companies that does small products. We're a reinsurer that typically covers large commercial business and cat business. So the fact if an online retailer sells, or has started to sell, which they don't right now. But if they started to sell home insurance policies, they will still look at, "Do we want to cat cover?" And the internal return requirements, the internal return on capital that they usually have is higher than what an insurance company internally would have for their own investments. So the appetite for buying reinsurance for a new tech startup entering the space, you would expect to be higher, they would buy more reinsurance than others. So for us, that is not necessarily bad. There is also an element of growth, that means that the market itself may very well grow,

if more companies start to sell insurance in different ways. And that could also open new avenues for existing customers to do more business. So I would not see that critical or negative spin, that I assume this is part of your question. I would rather see that as a positive there. And I would, of course, say if there was a conflict coming up, that someone started to really sell B2B policies, it's scaled to large commercial entities with a huge capital in the back that they would not need reinsurance, they would be bad for us. But so far, we have not seen that and of course we are in discussions with all the startups, even with the large ones, in particular with the large ones, because they are attractive and target customers for us. And there's, from all that we've seen, large companies tend to buy insurance and reinsurance from large reinsurers. So again, that is helpful for us and some of our larger competitors, because we have the global reach, we have the digital product expertise and can provide solutions that fit their needs.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Thank you. Nadine, you had a question?

Q - Nadine Adrienne Marion van der Meulen {BIO 15200446 <GO>}

A question for Marcus, I suppose. The future -- the sensors were handed out earlier. The future seems to be much more focused on risk prevention. Can you elaborate a little bit on what you think your role or your business model is going to be there?

Second question is, again, Marcus, you mentioned that the world is getting riskier. Apart from the obvious cyber security, can you mention other lines of business where you see opportunities in the future?

A - Marcus Winter {BIO 3035598 <GO>}

That's absolutely spot on. Risk prevention will be a core component of insurance products. You will see that in the commercial space. And in particular, for the smaller risks, that the insurance product will change its form. You will have not just the financial indemnification once the loss happens, you will have all sorts of service components. Cyber is a very prominent example. And Daljitt will talk about this in a moment. And where you really work with the components to assess and understand the risk in cyber. Once you understood and have assessed the risk, you also have measures to reduce the risk. And then you need a very fast response because different to many other traditional insurance claims, in cyber it makes a difference whether you react now, or in next week or in two weeks' time. And so the nature of the risk itself changes. And far more than in other traditional insurance and lines of business, in cyber. And in other new class of business, you reduce the loss amount by reacting early, by identifying, for example, a data breach early and by coming in with strong remedial actions early in the piece. So that's why we have to enlarge the value that is provided. And that has to be a combination of various components on the risk side and on the insurance side, to bundle that into these products. It's also not clear that the traditional one-year product cycle will survive these things. If you look at cyber or other new exposures, it might be better to have shorter or longer policy periods, which again is a big challenge for anyone that is stuck in a very defined IT and accounting environment. So that's again, is a positive for us. When you say, what is beyond cyber, I think the risk complexities that we see will trigger much more demand for business interruption policies, contingent business interruption will increase.

But we also see that -- but is still, I would say, early in the piece. Our market share in cyber is significant. And the growth there is stronger than in the other new lines. And of course, the penetration of the insurance and reinsurance markets in the emerging markets and our growth in market share in traditional markets, that is large pockets of growth, in addition to what we see.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Thank you. Samit, you had a question and then (Mauritzio) ?

Q - Samit Patel {BIO 16996758 <GO>}

Thanks. Samit from Goldman Sachs. Just on the data side of things, could you just, sort of give us some guide on how. And what percentage of your tariffs are currently being set with these new methods? And how you expect that to develop in the medium-term? Then the second thing was on, how do you protect these initiatives, the IP you create in these initiatives? I think we've seen in the U.K. a couple of examples where employees have taken stuff like price comparison websites and started their own, basically. So how do you protect yourself against this going on? Then finally, if you were to sell the run off business in ERGO or the ERGO Life runoff business, would that be a relief for your IT transformation in that business, or would it somehow end you?

A - Joachim Wenning {BIO 16273429 <GO>}

So to your first question, we are currently piloting the digitally augmented underwriting in various projects. So this is little more than half a dozen pilot projects that we're doing with some of our customers already. And that's why we are having feedback already on what the impact is. Of course, the goal is to make it available to potentially all of our customers. And also not just limited to motor business where we're doing these pilots currently. But also look into other data-rich areas, where we could apply the same methodology. To the second question, how do we protect it? Of course we take all sorts of technical measures as far as we can. But there is no 100% guarantee. One has to be clear about this. If the key people would leave. And take this IP with them, you cannot chop off their head. There's always a risk that know-how is getting off the company. And apart from that, regarding the technical measures, I don't think we can disclose them.

A - Mark Klein {BIO 1994583 <GO>}

Let me just add on what you said because especially on the tariff side, we have basically run very close together, because nexible is one of the examples where we started testing the new methodology and here, I think the U.K. market is, how I understood, really different than the German market. And in Germany we have much more the actuarial models, while in the U.K., by history, you're much more data-savvy and data-driven. So what we are currently jointly analyzing, how we can. So to say, evaluate our portfolio and drive that from a more data driven perspective. And it's starting with nexible, because it's easy, it's small and you can do some testing. We also have to see how we get that through regulation. We are facing the things that it's not easy to explain when you have a black box, what's behind it. So this is what we basically have to sort out. From my perspective, there will be a specific solution for the more -- German market that we have

to drive jointly with colleagues from Munich Re, from Wolfgang's team and from the colleagues from ERGO.

A - Joachim Wenning {BIO 16273429 <GO>}

Let me take your third question, with regard to the back book. Will this be a relief? In an IT sense, an IT legacy sense. It will not. It will not in 2 senses. One is, the back book is sitting in an encapsulated legal entity and that encapsulation means that already today, the innovation initiatives on the ERGO side, they are not at all burdened by whatever that legacy is in capsule. So if it is not burdened, then it would also not benefit if that back book was sold. And it will also not be a relief in the sense, any potential purchaser would take, of course, legacy also into account. And make you accountable for it.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Okay. We'll take a last question for this round (Mauritzio), please.

Q - Unidentified Participant

So my question is not just related to Munich Re. But also give you a feeling, in terms of how at least I perceive these. And not many here were around in 2000 but there is an element of dÃ©jÃ vu. This presentation, this technology, taking more and more pace -- space and now everybody's coming up front and saying, we are doing this, we are doing that, we're investing this, we're investing that. And here in 2000 was very similar. And then the whole thing disappear after 2002. Now we're coming back to it. Then you can see fantasy rankings, I'm sure you have fun as well looking at these, in some of the publications that you read where this or that company are better placed. Very hard to know how people from our world can actually judge in detail, the real capabilities because the visibility is very low. I mean some of the questions, you can see are trying to dig in terms to understand what the real impact is going to be of what you're talking about. There's a lot going on. But it's hard to separate what the contribution of these initiatives are in the real world, which is what we look at, the numbers. So I have a question in terms of the components to create these technology platforms, because obviously the data is your data, is proprietary, that's of course, has always been the case, by the way. It's how you slice it and dice it now, that could be different. But my question is, when you are -- and I understand that this can be very difficult to judge in precision. But when you look at the platforms that you have in place and you are developing, how much -- what percentage of the components of these come from external providers? And what percentage is actually something that you say, we develop internally? And I'm talking about, not data. I mean data, it's yours. But in terms of developing the platform, my perception is that, a lot of it is coming from external providers, now how you combine them, it's up to you. But is this -- this thing is available to everyone. I don't know, people talk about face recognition. And they throw smoke and this kind of audience says, "Wow, face recognition was Snapchat." This face recognition is a game. So I mean, we're kind of pushing these things a little bit too much. Now you have -- you're famous for being a kind of down to earth company. So that's why I'm asking you, I mean if you can tell me effectively how much of this is actually available to everyone in terms of components. And how much is actually developed from a technology point of view in-house?

A - Joachim Wenning {BIO 16273429 <GO>}

Do you want to kick it off, yes?

A - Mark Klein {BIO 1994583 <GO>}

Yes, I would kick it off. Well basically where you're fully right is, most of the components we are developing and using are externally available, standard software programs that we use and that implement. When I look what is the differentiator, it's, at the end, how you implement and how use the technology. There are huge differences. You can have 2 implementations of software, used in a different way, can bring dramatic, different results. Then you mentioned the 2000 bubble. And yes, it was a big one, where I think for me, when I look at it, I believe it is fundamentally different, because the technology is further developed. So the ideas. And many of the things that we are discussing right now are basically the same. But the technology is on a different level. Being it, how far the cloud has developed, the computing power, there were visions that were already in 2000 there. And I sometimes have also the dÃ©jÃ vu. I have similar discussions. But at that point of time, it was very difficult to implement them. And make them really happen. While now we see that it's really taking off. And for most of the use cases, you will find a company that is actually doing it, in the technology space. And that's what it is. So to say, our task, to bring that into our company, into our culture. And make that happen here. That's why, besides knowing the technology, making it accessible, which is possible, we have to have the right culture of implementation. You've heard in all the presentations that this is actually what we are working on, to make that happen in any way. So that's why, even though other companies could access the same technology, it's really about implementing and making it happen. And that is easy said, very difficult to do. It's not an easy task.

A - Marcus Winter {BIO 3035598 <GO>}

When you look at some of the technologies that are out there, I was really enthusiastic about Artificial Intelligence. We had a trip to Silicon Valley three years ago. It was the first time that a company really showed to us, how they could, with Artificial Intelligence, select images. They could key in a word. And the computer would give back the pictures that were intentionally associated with that word. And they -- that was in one of the (received) companies there. And they had a separate, large room where they had cooling device for the computers to run that artificial intelligence, three years ago. Now we do that with -- in Wolfgang's team here in-house, upstairs, more or less. So the technology will change completely. You will have that. And you partially already have that. You will have that in your smartphone within no time. So that's -- it's absolutely possible. And it's not our ambition to compete on technology. What we compete on is on insights into risk management, underwriting claims and the insurance procedures. That's why we have the domain expertise, that's where we start and have started to accumulate know-how around, how do you train the AI for an insurance case? How do you use a certain insight for risk management. How do you establish partnerships with incumbents or with startups, or with whoever, to really come into a network situation where you can flexibly apply your solutions towards new customer groups in a regular way? So I think that completely rely on outside technology. But we need to have very good experts internally. And so that they can combine the dots and work on the solutions in any point in time.

A - Wolfgang Hauner

And it's also about understanding the technology very well, that's why we work very close with the large technology providers. And have a close dialogue also with them, on what is going to be developed, what we can use in half a year or years' time, to prepare and to early adopt these technologies. And also it's about, like Marcus said, making it available for the insurance-specific cases. It's not just about face recognition, it's about image recognition in the broader sense. And to really train those functionalities on our specific data and that's what we need to achieve. Of course, we are not developing Artificial Intelligence as a methodology, completely new.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Okay. Thank you, gentlemen. And thanks for your questions. We are running behind schedule, which I think is a good sign. So what we will simply do is, we will have a break now until 11:15. But please be back on time. And we will then continue with the second track. Joachim will be with us again later in the afternoon for potential additional questions. Thank you. So far.

(Break)

+++presentation

Okay. Let's move on. Second track on business transformation. And before we get started, I'll also introduce my 4 colleagues now onstage. Starting with Daljitt Barn, who will do the first presentation. Daljitt is a cyber risk expert that has now transitioned into a cyber insurance leader role. He was in the cyber market for 20 years, gaining experience across all aspects of cyber security. He created and chaired the Cyber Risk & Insurance Forum in London. And he's a member of Geneva Association's Cyber Working Group.

Next to him, Mary Forrest, President and CEO of Munich Re North America, Life and Health. And she will talk about the Canadian multi-channel distribution. Under Mary's leadership, Munich Re has become the largest mortality risk taker in the Canadian market and a market leader in the United States. Mary joined Munich Re back in 1991 and was a member of the executive leadership team for a number years before assuming her current role. She holds a Bachelor of Science and is a fellow of the Society of Actuaries and of the Canadian Institute of Actuaries. Mary is a passionate member of the insurance community, serving as the Chair of the Board of Directors of the Canadian Life and Health Insurance Association from 2015 to 2016.

Karsten Crede, right next to her. He is the CEO of Mobility Solutions, presenting ERGO Mobility Solutions. For about seven years, Karsten was a member of the top management team of Volkswagen and responsible for Volkswagen's insurance business. From 2009, he was the CEO of Allianz Global Automotive and became a member of the Board of Management of Allianz Versicherungs-AG one year later. In 2017, Karsten joined our ERGO Digital Ventures and is responsible for the Mobility Solution business.

Last but not least, Ritesh Kumar, Managing Director and CEO of HFDC ERGO in India, talking about mass customization in India. HFDC ERGO is the third-largest private general insurance company in India. Ritesh is also the regional COO for ERGO International,

responsible for India and Southeast Asia. He has over 25 years of experience in the financial service industry, holds a degree in specialization -- MBA degree with specialization in finance and is leading HFDC ERGO now for about 10 years.

Thank you, colleagues. And I hand it over to Daljitt.

A - Daljitt Barn {BIO 20704654 <GO>}

Thank you, Christian. Okay. Daljitt Barn, okay. So good morning. We had some pretty good conversations last night with 1 or 2 of you about cyber. So I'll try and demystify what the topic is, how it's related to business transformation organizations are going through, from small to large, when they think about cyber.

But to start, a little bit about our history. So we've been writing cyber for over 10 years. And that's a reinsurance play. And we'll -- I'll go through all our business models: reinsurance, primary, partnerships, white label, which I think, to most of you, will be quite new. We have an ambition to be -- to have 10% of the overall global market for cyber by the end of 2020. And we'll go into that in more detail.

And that growth will be organic, if we think of some of the reinsurance models. But then, actually, our approach to primary, also white label, will see increased growth. And as we're a risk taker and we really understand complex risk in our other lines of business, we take that approach and mentality into cyber. So this isn't Munich Re trying to just write any type of cyber risk. We do participate cautiously.

There are some brands there. So HSB in the U.S., they've got a very large cyber book. And that's an assumed model. So B2B2C. They assume all the risk, 100%. And pass that through to insurance carrier to the original -- the end client. ERGO has a cyber book, a growing book for both their core business and also ERGO Direkt. Then we have the syndicate. The syndicate has been writing cyber since 1/7 last year. So they've already got a market to approach from the mid-market, marine, aviation, those sort of things. And then also, corporate insurance partners to do cyber as well as our reinsurance models.

A few global trends to start with just to kind of paint the picture of where we are. So we've seen strong growth in certain industries, manufacturing, you'll see retail, those sort of things. There -- last year and maybe 2, three years before that, the type of breaches you would see were related to retail. So data-type breaches. Target stores were probably the landmark kind of breach.

We now see different types of breaches. So ransomware as well as, as you move through digitization, you're connecting old to the new. You'll see systems that shouldn't have been ever in line of sight of somebody externally, now are. So then you see IoT being leveraged. So it's becoming quite a complex picture. And rather than just thinking about business interruption and data -- sorry, just data breach, there will be more business interruption aspects to cyber.

From the penetration side. We still think the addressable market in the U.S., where it's the largest cyber single market, is still only at 20%, okay. There's various reports written every year saying they think it's a lot higher. We, through our reinsurance model, think it's about that. Then in the rest of the world, U.K. and then Far East Asia, Africa and South America, that's kind of still at just under 5%. So there's a lot of opportunity for us to write cyber.

And to write cyber, there are developed -- developing markets. For example, Japan. Japan cyber market is very much SME-focused. But they have some very large industries, okay. The global electronics brands and things. So they are now considering how can they work with Munich Re to target some of those industrial clients, okay.

Lloyd's is a very vibrant insurance market, now has 60 syndicates writing cyber, okay. Maybe only two years ago, that was probably 30, okay. So there's more and more capital gaining -- going into the cyber insurance market and more and more of the MGA model being used, okay. And actually, we see, through this white-label approach, our cedents in emerging markets wanting to have cyber as a line of business they can offer to their clients. And we're embracing that.

I wanted to mention now a little bit about some of the things you may have heard in the press in the last year. So WannaCry is an example. So I'm not going to go into too much detail about the particular vulnerability. But in essence, the way these things go to market is there's always some sort of vulnerability in a system, say, Microsoft or some sort of ERP system. Then there's an exploit. Then typically, somebody will use that exploit to create some sort of targeted attack, okay. Ransomware is a great example of that targeted act.

And one of the things that we saw is how quickly it propagated across the world. So a bit like a virus propagation. And the insurance market, they looked at this and thought, actually, have we got the right models to detect those? Munich Re has, okay. But then because it took -- because WannaCry touched people's lives, it was in the press, the NHS, the National Health Service, for those who that aren't aware. It's the U.K. private kind of health service -- a public health service. They had to shut down systems, okay. So there was a real tangible impact from WannaCry. But there wasn't an impact to cyber insurers because of retention and waiting periods. The bigger impact is on the business interruption. And we'll come back to that in a little while.

Okay. Some numbers. As you're all analysts, you want to see numbers. So our assessment of the market is the global cyber insurance market at the end of 2016 was $3.6 billion, okay. We expect it to be between $8 billion and $10 billion by the end of 2020, okay. Some people might say it's slightly more. But we're tracking those sort of numbers. So the strategy we wrote internally is based on our growth up until the end of 2020, okay. And we will revise that as we go along. But the global market is 85% U.S. domiciled risk. Even if it's risk in London, it's 85% U.S. domiciled. So it just shows you the models that we have today and the experiences are mainly U.S. focused.

One of the biggest triggers or growth aspects for cyber is the EU GDPR, okay, because the reason the U.S. market has grown is because every federal state has some sort of privacy law. So it's quite litigious. And actually, some of the heads of damage and heads of

CUPA are related to that. So you can get support -- legal support. There is credit monitoring, all those sort of things. And with GDPR, there is, within the act, mandatory breach reporting, okay. That also lends itself to cyber insurance as something that people can get financial assistance for and potentially, where legally permissible, is maybe assistance with a fine. But the insurance industry is still working through that with reinsurance regulators.

Our global book by the end of 2016 was $263 million. So we want 10% of the market by the end of 2020. So roughly, our book will be around $880 million. And we had -- so we had, last year and this year, 38% year-on-year growth. This year, the number will be similar. So we're growing faster than the market with our business models, our distribution models. And to date, this has been a very profitable class of business, not just for Munich Re. But for other carriers, okay. But that doesn't mean we're not cautious of the kind of accumulation issues, the systemic risk that cyber presents. So we'll also -- we'll touch on those.

Okay. So cyber, I wanted to try and describe. But not just cyber the insurance. But cyber the peril. So it's almost like 2 sides of the coin. And both need to talk to each other. When I did presentation in the past for Geneva Association or even for the Chief Risk Officers Forum, I described it as those 2 things. And actually -- so as an insurer, reinsurer, we're very much focused on the product. But actually, internally, how do we protect Munich Re, the house, as your organization trying to protect themselves? And we try and learn from each other. And these are the 2 sides of the coin. And actually, how much investment goes into that is maybe the edge of the coin, yes, because it will go one way or the other.

So this is a rapidly -- as a peril. So as a risk, it's rapidly evolving, okay. As we've seen the threat actors, as we call them, the crime, the hackers, they're always not just 1, 2 steps ahead, maybe 4 or 5 steps ahead, okay. It's inhomogeneous. So different shapes and sizes. You can't really quantify cyber. A small business may just as likely to be attacked as a large, yes. And actually, some small business gets attacked because it's within the supply chain of a large business, because that's the real target, okay. And so it's quite a complex domain to try and actually understand as an organization to protect themselves.

The crime numbers, there's been various out there. People say it's around $400 billion as a market for crime. So there is a lot of focus internally within organizations to try and suppress the risk. When organizations look at cyber risk, how much money do I spend on cyber risk versus cyber insurance? It's considerably more on the risk side. But actually, large corporates come to this almost realization point of, do I keep buying technology? Do I keep building teams when inevitably, we're just as likely to be hacked as the next guy? Then do I look at risk transfer? Then that's the risk-transfer exercise that comes into insurance. And actually, we see that more and more, where they ask Munich Re to come and talk to them as part of almost a governance thing. SEC especially pushed this out to say please think about cyber reinsurance as a risk transfer mechanism.

And the key point here is cyber past doesn't predict cyber future. So even if you think you've seen the models before, they will change, yes. So just because we -- and the classic example is Equifax. So even though we've seen a lot of ransomware, we've seen a

lot of business interruption, the good old data breach came back in Equifax. So it's not going away.

So cyber as a control. Very briefly. This is kind of the edge of the coin, yes. And this is where we track -- the reason I put up this slide is because we try and understand when we're selling cyber, what is really going on within a client, okay. So some SMEs, they'll be just a one-man shop. And he's not really going to be able to think about cyber. He's just thinking about is his business running, okay. But then when we go to mid-market further up into global enterprise, clearly, they have a lot of people trying to understand this risk, okay. And that -- for them, trying to risk and trying to mitigate the risk is where some of the techniques they use, we are now adopting within cyber insurance, yes. So if we've got the data, how do mine the data to understand the patterns? So what's the signal in the noise, okay? And I'll explain how we do that in the next few slides.

But the ROI piece is very interesting in an organization. And actually, through our go-to-market, we're looking at more consulting-type services to help organizations really understand what they need to insure, okay. And it's kind of if there was a manufacturer, go-to manufacturer. And we're helping them to understand, is there systemic risk in their system? Is M&A in the future going to change their risk profile? That's all related to risk management and insurance, yes. So it's kind of coming with a program approach.

Then on the product side, which is the cyber insurance, yes. We've seen this morning about digitalization, automation, machine learning. Clearly, those are aspects of how technology is changing. Autonomous, for example. There will be cyber impacts for autonomous, okay. And managing the risk and pricing it is probably, from the conversations last night, one of the most important things the market is addressing. Is it people focusing on just the market price? Or is there some sort of technical analysis behind? Is the tools behind that? And we do that. So Munich Re have built technical pricing tools. Just so that actually we acknowledge what we think the price should be commensurate with the risk as opposed to what the market price ends up being, yes, because you only learn from your losses. And that's one way for us to learn.

Taking on risk. We're a risk taker. Munich Re has a long heritage for that. So that's why we're in the cyber business. We're helping people understand this particular peril, okay. There hasn't been a very large quantum of claims. And actually, going back to my statement, if you read too much into the previous claims, you may miss the future ones, okay. So it's building those accumulation models and actually trying to run those through your own portfolios and your clients' portfolios to address those risks.

Okay. So just to tie those previous slides together. So commonalities between the 2 worlds. The risk world. So my old career, versus the new world of the product. From the people side, there is definitely a lack of trained and skilled people, okay, across the market, not just in cyber risk. But also, I would say, in cyber underwriting.

One thing we've done is we have -- we had a project, which was sponsored by the board, which was to bring in more cyber expertise and convert them to underwriters, yes. So they already know the peril. Can they learn underwriting? And this early indication that

actually the people who were doing that find learning underwriting is easier than learning cyber security. And actually, while they're here, they're augmenting our ability to understand the risk from the hacks, yes. So it's a very good approach. But not many of our competition are taking that view of the world, okay.

Driving -- I think regulation will drive the market in the next few years. As we've seen with our 85% number, the U.S. had been driven that way. GDPR will also do that, I think, across Europe. Our estimation by the end of 2020 is, if it's 85%, 15% last year, it may become 65-35 as a market. So U.S., 65%; rest of the world, 35%.

Then on technology. Digitization is causing issues for clients in general, yes. They are being attacked because they are connecting things and their business models are changing. We see that as an opportunity in the product because we can use it as distribution, okay. For an example. So personal lines is very good opportunity. And something like a telco selling a mobile phone with cyber insurance is a great example of a distribution model, yes. An antivirus company selling antivirus could also sell personal lines and vice versa because they're very similar price points, yes. So we think the digitization will actually allow us to think differently about what do we need to do for cyber insurance.

So a little bit about the growth areas within Munich Re. So reinsurance and primary. So reinsurance, we're the first market, global leader. What we do is we work with our cendents, help them, grow their portfolios, discuss different markets with them. How to -- we actually sometimes run their portfolios through our accumulation models ourselves, yes, to give back. We're not just reinsuring taking that risk, we're actually giving back some data to them, yes. And that's where that market leaders come from, working with them over the last 10 years in the U.S. market. But again, focusing on accumulation.

In the primary world, we have Hartford Steam Boiler. And as you can see in the $263 million number, Hartford is the lion's share of that primary insurance model, okay. And the newer entrants, Corporate Insurance Partners, ERGO, Munich Re Syndicate, will grow out towards 2020. And we think that split may change slightly moving forward. But at the moment, we see, in the last few years, it's very similar, almost 50% each between reinsurance and primary for growth.

A little bit about insurance coverages because we can't talk about cyber without coverages. So already in the market. So as you can see, the complexity and exposure increases as you move kind of from left to right. So people traditionally, over the last 10 years, have been a looking at loss of data, network impacts, extortion. And we've even now seen property damage. So certain carriers saying, okay, if there's an electronic attack and it causes a property damage, physical damage, it's covered, okay.

And it's not completely across the board. But that does bring into the regulative view of what's affirmative. So a standalone business, okay, what do you get covered? Then what is silent or nonaffirmative? Am I allowing cyber in other lines of business and not actually getting -- understanding the exposure or getting paid for it, okay?

And the best way to kind of use the kind of affirmative and nonaffirmative approach is to think of these 2 buckets in each, okay. So the 2 affirmative buckets are cyber standalone. So I buy a cyber policy, okay. Then there is the second affirmative bucket, which is traditional lines with endorsements. So household policies may have a cyber endorsement, yes. We can manage those 2, yes. They're easy because we know exactly they're coded correctly and we know what they're doing.

When you look at nonaffirmative or silent, then you will have the exclusions. So the NMAs, the CL 380s. And so is there some cyber coverage that's being allowed but it should be excluded versus the other silent coverage, which is there's no exclusion whatsoever like in an all-risk name policy. So actually, will the client be able to make a claim, okay?

The regulator, especially the PRA in London. And we worked with them to -- for their expression of interest around their supervisory statement. We went back to them and said, yes, silent, if we suddenly created a very stringent view of silent, we'd probably find we, across the market, would be reducing price on loads of risks and actually, we would be -- it wouldn't be profitable, okay.

So the way to look at silent is, first, identify what risks you have in those other lines, okay. And then learn to track them, okay. Then you may be able to exclude certain things, ideally price at the end. You can't just suddenly go to price because it's a soft market. Clients will not let you do that. And we already know of certain property carriers wanting to give cyber away, okay, in very small limits. So there is issues around growing securely within the market. Munich Re take a very firm approach. And you'll see that in the next few slides.

So accumulation. I wanted to mention our, kind of, 3 -- there's 3 distinct accumulation models. And the fourth one is just the failure of external networks, which is where I refer to we take a stringent view in the market. What I would say is there probably isn't many other carriers who will openly say that and give dates to accumulation models, okay. Definitely, some of the largest carriers have only been looking at this for 2, three years max, okay. And the dates here aren't the date we started to do a model; it's the date we internally said we would budget for certain things, yes. So it's part of the underwriting process. But we've been looking at these, running these models for a very long time.

So the 3 core models are: first one, IT virus. So for example, WannaCry or NotPetya, those kind of ransomware. It would have been included in here. And that's why we budgeted for that sort of thing. So it's propagation of some malware and affecting large -- one attack affecting large systems, okay.

The second one is data breach. So the traditional breach like Equifax, like Target stores. But also more cloud focused, okay. And the interesting thing moving forward is if all business becomes cloud enabled, we'll put more emphasis on that, yes. So this is where this back to digitization and changing business models is very important.

And the next one is around -- we call it corrupted software. So Lloyd's had built a similar model. And this is where we have a large vulnerability in, let's say, an ERP system. And

actually, at the same time, there's vulnerability in a perimeter router. And we have -- a hacker can see how we can actually manipulate all of it because it's very common deployment model across large organizations, yes. And extract the various data and business interruption things.

The failure of external networks. We exclude that particular peril probably because you just need a frequency of 1 to have a very large severity. So this is all about networks that are not in the control of the original insured Internet, yes, power outages, yes. They are the systemic issues, yes. And the interesting thing about some of the power things are through that because do a lot of work. As Marcus Winter mentioned, we do a lot of work talking to those people in Israel, yes. And Silicon Valley and especially in Israel where they have a certain type of offensive cyber expertise, okay.

And they talk us through why in cyber insurance don't you see many more power attacks, okay. It's probably because it's been difficult to monetize those attacks. You can monetize selling data, yes. But it's difficult to monetize the others, yes. And as soon as they realize there's abilities to monetize those, we meet in more of those type of attacks as well.

Okay. And just combining those again. So from an underwriting perspective, internal systems owned by the clients are typically covered, okay. The way the industries viewed cloud and the various services within the cloud are their named providers on a policy, on an original insurance policy, okay. Then what we do is we -- and actually, maybe, 17 of the top 20 cyber insurance carriers also do this. They exclude the external networks, okay. Those in the market that may include some aspects, maybe not the fullest. But some of this, are just looking for differentiators. And we say you can look for a differentiator but there will be an accumulation risk on your book, yes.

So just to summarize, I think definitely within Munich Re, we built -- we're continuously building this expertise and experience, sharing between the internal risk side and the cyber insurance side how to, through the underwriting process, get better information and look at that for the benefit of our insurance clients, cendents and as well as the original insured in our primary model. We're building digital platforms for cyber.

In a way, the kind of parting message I would have is think of it as 3 blocks, okay, or foundation blocks. Accumulation is the foundation block. If we don't understand accumulation for cyber insurance at the bottom, we might as well -- the risk appetite changes, yes, within the business.

The next block would be data. How do we, as Munich Re, get access to more data, yes? Typically, as a reinsurer, we would get limited data, okay. That's why the white-label model is so interesting. So white label is where we enable a carrier in an emerging market to write cyber. So effectively, we give them -- think of it as a Munich Re box. So in the box is pricing tariffs. In the box is wording. In the box is service providers, the post, pre and all that sort of stuff as well as accumulation model. Our competition don't do that. So it's a very emerging market for us because we're helping actually grow the market for cyber insurance.

Then on the innovation side, we're looking to do investments in cyber insurance, okay. And some of that will be working with partnerships to augment the underwriting process. That could be, can I get access to -- in an underwriting portal, do I want to apply some machine learning, natural language processing to say, okay, in the type of data we have, what could the next -- what does that next risk look like, okay? And maybe more on a kind of SME smaller level of risk.

Definitely, for our large corporate risks where we would apply more of a bespoke model, okay, rather less automated, more bespoke, that's where we have to show risk mitigation commensurate with that risk in their actual business models, yes. So that's more on the ground consulting. But actually, some of the things -- some of the tools we're using are quite innovative to understand what their ongoing risk would be.

So I will hand over to Mary. Thank you.

A - Mary Forrest {BIO 15882114 <GO>}

Great. Good morning, everyone. So today, I'm here to speak to you about the Canadian multi-channel distribution. So it's an idea that we've been working on actually for the last few years. I'm just going to tell you very little bit about the Canadian market and our penetration in both the individual side and the group side.

So if you look on the left-hand side, we normally -- when we talk about individual life, we talk about in terms of sum insured. And as has been mentioned previously, we are actually one of the -- no, we are the largest mortality carrier in the market, even if you compare ourselves to direct writers and to our competitors. We have 20% of the entire individual life mortality market. So you can see, even from a new business standpoint, the total sum insured is about $160 billion. And we've been in the #1 and #2 position in terms of like new business.

And if you look at the group reinsurance market, which is where our multi-channel distribution strategy takes play, you will see that we're by far the majority penetrator in the market. We have a 79% new business market share. So just to put it all together, just if you want to talk about in terms of premium, if you look at our total in-force premium, not including the FIN RE deals, we write about $2 billion of total Canadian premium. If you look at our competitors, RGA and Swiss are about $1 billion each. So that's just to give you an overall sense of our penetration in Canada.

So overall, the Canadian business for us has been very profitable. It has done very well by us. Our big concern in the last few years is, how can we sustain our growth? How can we sustain that kind of penetration? So we decided to focus on the group market. And I'll give an explanation why. When we looked at the group market, you'll see a bit later on, it is a saturated market. But we think there's a great opportunity to open an untapped market in the group space and to enlarge our current product offering to our clients.

So on the group side, as opposed to on the individual side, we offer far more services to our clients and we're willing to get paid for that. And on the individual side, it's more of the FIN RE type of deals, which is where we get additional source of profit. And with this

idea, we are hoping to not only increase our reinsurance revenue but also develop a new revenue stream.

So the Canadian group benefits market. So currently, there's $40 billion of premium in group. So this is -- if you look at the entire market, all the group players, there's 35 million Canadians. 20 million are mandatory insured, right, that have purchased group insurance. So it's a very different market than some other countries. But if you can see, it's only 2% to 3% that purchase voluntary benefits. And we think that there is a huge potential to increase that. We think that there is still a number of Canadians that do not have enough insurance in play.

So in the group space, even though you can see it's very saturated, there's a number of problems. So there are 3 companies that dominate the group market. If you look at the policy underwriting time lines, very long. If you look at a lot of the processes, even though a lot of companies do have a platform, still very manual process in the background. Even if you buy a policy online, you -- sometimes you can't get the policy instantly. There's still more questions that you have to ask after the fact. So there's a number of problems all throughout the process.

So we actually looked at every single component. And we wanted to build a platform that would take care of each one of those issues but not just look at it from a consumer viewpoint but also look at it from a plan sponsor and our client viewpoint.

Okay. So if you look at our innovation strategy, we wanted to create value for every single player in the value chain. So starting from the member, which is like the employees, we wanted to improve the experience by making it far easier for them to buy insurance.

We wanted to make it a lot easier for the sponsor. So the sponsor is the actual employer that provides the group benefits. So we wanted to create a platform so that they can provide benefits to their employees and hopefully retain them -- hopefully increase the retention of their employees.

We certainly wanted to make it easier for the broker. Right now, the broker is not just selling business. But they're involved in a lot more administration activities. So we wanted to take away the administration part and just have them focused on the selling part.

And in terms of the carrier, we wanted them to have a -- to be able to offer new insurance products at low cost and much quicker times to market because again, because a lot of the companies have legacy systems, even if they -- we come to them with a product that they're very interested in and they want to offer it, they're not able to administer it quickly. It takes them time to put it through their systems. So we found a way to deal with that.

So I'm going to just to play a short video that we show our clients.

(presentation)

Okay. So what is our objective? So we are not there yet. Right now, we have only offered -- we've built a platform. We've offered life and CI. We just started in January. We are launching pilots one after another. The last one was November 13. Our next step is to add P&C products. But if -- what we want is the employee to be able to look at all their insurance coverages in this platform.

So if you look at all the different coverages that we have in place -- or we want to have in place, it's life, P&C, CI and health. We already have core expertise in this. And we reinsure all these different types of products. So our mandate, for myself, is only life. But of course, we're going to partner with our other entities that take reinsurance in these other lines. And for wealth and future products that we also want to eventually put on this platform, which won't be next year, probably the year after that, we have to look at external partnerships for them to take the risk.

So again, we are -- we've designed this platform as a reinsurer. We are white labeling the entire process. But we still need the insurance carriers in the background to basically take the initial risk and to be -- to take the initial licensing.

So as mentioned, you can think of this as a virtual insurance company. It can handle absolutely every aspect of the sales cycle. And we've even partnered up with an administration company. So what we did is we scoured the market. We looked at which companies had the best admin capabilities. We found one partner. And they've even upgraded their platform so that we wanted to make sure that they would be able to handle administration of new types of products.

Okay. So overall, what we want to do is to basically have a dashboard. So even though you're buying from different companies, right now, an employer or any kind of person, they would have to look at different pieces of paper or different programs to see what all their different insurance are. And we want to do is basically have one dashboard where you can see what life insurance do I have in place, what house insurance I have in place, what -- fire insurance, everything, all in one spot.

So what we've done is we've created a completely modular platform. And this is what was mentioned in the video. There are -- we have some of our clients who say, "Look, we're very good at administration. We want to keep the administration aspect. Or we pride ourselves on being very good at the enrollment process." That's fine. We've made it so modular that we can put any piece in place or put -- or plug out any other piece in place. So whether it's the products, carriers, policy admin, customer service, the adjudication, we've made every single component of this platform completely modular. And you can plug and play any particular piece that you want. And it can vary from product to product.

So what we've also done is created a digital agency. So what that means is that we are the digital, we're if you want to call it, broker of record. So what advantage does that give to a company and in particular to a broker? So let's say you have a P&C broker that also wants to add life coverage to -- and offer that to their group and their clients but they don't have the license. Well it doesn't matter. As long as they use our platform, because we have other life brokers that have the licenses, they would get paid a marketing fee

and they can still offer life products to their current P&C clients. So this allows them to sell products even though they might not have license as long as they go through the digital agency, which is instead of thinking of that as a physical broker, it's actually our digital platform.

So what is our goal? We want, in five years, to manage $1.6 billion of premium. So this is manage $1.6 billion. This will not be the premium that we're necessarily going to get because some of it may be that will be administering this premium. But this is the amount of premium that will be going through our platform. And as I mentioned previously, over half of it is going to be coming through reinsurance. And the rest will be transaction and marketing fees. So overall, we definitely want to become a very significant player in the group insurance space.

So this is just one of our earliest pilots. It's still running actually. So this was on CI. I should say it's -- the pilot looks really good. And part of the reason is that we -- because we did this in January, at that point in time, our platform was only for new employees as opposed to existing ones. Now the one that we just launched in November can also handle existing employees. So new employees would be more open to buying coverage. But nevertheless, if I look at CI normally, when you offer voluntary benefits, you get a 3% take-up rate. That's pretty much like the average in the industry. If you looked at our actual results, we were actually shocked. It was like 35% take-up rate, 1/3 of the new employees. And this is a sample size of like 6,000 employees. So it's not massive. But it's still sizable enough that it gave us a very good feeling that we're on the right track.

And I don't put this on the slide. But just to give you an example, we only had it up to a certain amount. And after that amount, our platform didn't handle it. We didn't have the underwriting data to be able to do it automatically. And there were individuals that said, "I want to increase my amount." So because our platform couldn't handle it, we thought, okay, put them back. We don't want to turn them down. So put them back to the regular process like normal paper underwriting, whatever. What was our take-up rate? 0.

So it's interesting, just making it very easy to buy the product with information being auto-filled because you're already employed, those are all the information that we want, making it really simple to buy, made a massive difference. And again, the annual premium went from an average of 150 to 250. As mentioned earlier, sometimes, it takes four months to enroll. This was from 30 days -- 30 days for CI to just two days. So massive improvement in all areas.

So this is just my conclusion. We're very excited about this. We've been working at it now for a number of years. It's extremely ambitious, our plan. But we really believe that this will definitely give us an additional source of revenue and it will further deepen our position in the group space. Thank you very much.

A - Karsten Crede

So hi, everybody. We are the new kids on the block. We just started our business January 1, 2017. I'd like to give you an overview where we currently stand with ERGO Mobility Solutions and what we intend to do in the future.

Ladies and gentlemen, economic growth in the world of tomorrow would simply not work without mobility, mobility of people, goods and data. And as an international insurance company, we simply need to deal with that. Mobility has also always been a basis for innovation and employment. In Germany, we have 1.5 million jobs directly and indirectly connected to the car industry. The automotive industry, as the motor of mobility, is currently facing the biggest challenges and opportunities in history.

Billions of investments in technology infrastructure, new business models and the mobility concept have already been decided. With ERGO Mobility Solutions, we have decided ourselves to position Munich Re and ERGO as a strategic partner of the automotive industry. With a dedicated unit and team combining comprehensive expertise along the entire automotive value chain, we will support our partners on their automotive battlefields: connectivity, autonomous driving, car sharing and e-mobility. Therefore, we are mobilizing Munich Re's and ERGO's strength and combining our forces and infrastructure in the B2B2C automotive segment.

Where do we start from? Let's have a look on the German motor market -- motor insurance market, where you can see that today, almost 40% of overall gross written premium in P&C are produced in the motor segment. At the same time, motor has been the strongest growth driver in the P&C segment. Having in mind that upcoming autonomous driving cars will reduce accidents significantly, it is time to work on new business models, new profit pools and extended product and service solutions. Motor insurance for us in the insurance industry is something what the combustion engine is for the car guys. We will still need it for the foreseeable future. But we also need to work on intermodal future mobility solutions, far beyond a pure product solution as we know it from the past.

Trends due to technology evolution, changing customer demands and volatile market environment results in challenges for the auto as well as the insurance industry, which highly coincides. Together, we are working for massively reduced emissions and less people dying due to traffic accidents.

Let's have a look on the future profit pools in the mobility ecosystem entirely. Profits from selling new and selling used cars will only account for roughly 10% in the future. However, revenues from vehicle-related services like financial services and after sales will continue to be the industry's profit backbone with almost 80% of the total profits. As there is high interdependency between vehicle-related services and the insurance products and claims management, we see a highly convincing strategic fit between those industries.

We see ourselves as a kind of Tier 1 insurance provider, helping our partners stabilizing there profit pools and work on innovative mobility solutions in the future. To support the partners in the challenging waters of mobility of the mobility ecosystem, EMS will just -- will not just be a traditional motor insurance provider. It will rather be an integrated player within a modern mobility ecosystem.

One important success factor in this ecosystem is to provide customers access to various mobility services and transparency on options, costs and risks as well as cooperation with

many partners in the ecosystem. As just depicted in the previous slides about interdependency of the profit pools, EMS is able to support the OEMs and mobility providers as well on numerous levels, from jointly reducing total cost of mobility, especially for young drivers, to stemming investments jointly with the group potentially as a strategic coinvestor.

EMS is a B2B2C business model targeting cooperations with automotive OEMs, automotive retail groups, the dealerships and the intermediates such as leasing companies. Specific about the EMS business model is the target to build strategic partnerships along the automotive value chain taking a long-term view. Of course, EMS, as insurance partner, covers the financial services part as well as the insurance coverage needs and other areas of the value chain such as production logistics and new mobility.

To do so, amongst other things, we have attracted a dedicated automotive team with the network and the relevant automotive know-how in order to meet our cooperation partners at eye level and be able to add value from the very beginning. This includes setting up also a kind of mobility or intelligence competence center focusing on the most relevant megatrends we are facing. This is autonomous driving, connectivity, e-mobility. And of course, the shared mobility -- the sharing services.

As an example, I would like now to elaborate a little bit on our first partnership with Ford, which we have already agreed on. In our joint development partnership, we are working intensively on future topics on -- of electro-mobility, driver assistance, partial autonomous driving and connectivity to achieve an improvement in total cost of mobility. And also, we are discussing modern insurance solutions, for example, pay as you drive, things like that.

For instance, how will Ford be able to drive down damage frequency and cost by adding certain assistance systems to a special model or the standard option range of a car? By doing so, total cost of mobility will decrease and the car might be more attractive, for example, to fleets. Ford is also the preferred partner for ERGO's company and staff vehicles. So you can see there are multiple areas how to collaborate with the car industry.

Another supporting piece of our strategic partnership with automotive OEMs is that we are building up after-sales agreements. As you could see, the after-sales segment and the repair shop and the spares parts is one of the most profit segments for the car guys.

The logic is quite simple. If an ERGO customer has a damage and contacts us to help him with repair, we will guide him towards the authorized partner workshop of the automotive OEM we are partnering with, thus creating a situation of many winners at the same time, OEM, customer, of course. And us. The OEMs can sell more original parts. The authorized workshops can sell service hours and use the customer contact point to create customer satisfaction. And ERGO is able to receive special terms and conditions from the brand itself. Not to forget, the end customer, of course, will have the benefit of a high-quality repair, using the needed special tools and latest training efforts on his car with the consequence of most probably higher residual values.

Our strategy is based on 4 pillars: growth, digitization, technical excellence and collaboration. We are building up with strong base capabilities and to create a competitive edge. Automotive insights are strong differentiating factor as well as the omni sales channel approach, advanced data management, digitized core processes, low-cost capabilities. And also, of course, we want to optimize our bargaining power with our claims (steering) approach. And we will collaborate wherever possible and wherever it makes sense.

So internally, we are joining our forces with Munich Re and all the other involved parties in the ERGO world. We have strong units here where we have already made some early experiences and success cases in organizing our internal, what we call, interlocked business models.

So the -- we will -- EMS, of course, will meet the basic requirements and we need to do this of digital customer interaction such as multi-channel communication. On top of that, EMS will drive innovation by implementing innovative approach for the near future. For example, replacement of lengthy tariff questionnaires, using Big Data analysis, leverage sensor data from modern and connected cars to radically improve to first notification of loss and claims management processes.

This means that in the future, EMS will be able to receive notifications about accidents automatically. And the analysis of sensory data will allow to precalculate the amount of loss even before the car has reached the workshop.

Customers and vehicles are increasingly connected. This enables a multitude of innovations regarding the traditional value chain as well as the development of new business models. For instance, connected cars will be able to transmit realtime accident data and will allow the acceleration and automation of claims handling. With the broader proliferation of electric vehicles, realtime using and charging data will allow the development of battery guarantees or pay-per-use products.

How do we cope with that? We deploy an advanced data management strategy on Munich Re's micro service and Big Data infrastructure. We already linked this platform to some OEMs. Based on further data insights, we will also deliver new services to our B2B2C partners. And what is also very interesting, how do we organize the future format of our collaborations?

There will be business development and sales partnerships, as an important form of cooperation. It can be a starting point with some partners and can bring great benefits for both sides. As mentioned before, Ford is a great example where we already, right on track upon the development collaboration, which is another form of collaboration. With other partners, we are also in talks to create a strategic vision of a kind of joint financial services or even a joint risk carrier. Reinsurance is also part of our portfolio. With Munich Re being a strong foothold in the markets and an area where we see a lot of potential for collaboration in China, for example, we are mainly dealing with reinsurance solutions.

Acting as a mobility service provider for the automotive industry, we can combine both industries in innovative products. Strategic collaborations also on the primary insurance side. We can imagine to optimize our competitiveness and international infrastructure. We know this from the car industry and from software guys, of course. They are collaborating very intensively in comparison to the insurance industry where the depth of the value chain is above 90% or something like that. We are really working on collaborating along our entire value chain as well.

Coming to the target markets. During the first phase, EMS is targeting Germany as our home and anchor market, of course. And additionally, China and India, probably the most -- or at least China, the most important future market, not only because of the size. But also because of the innovation power.

Nowadays, China has a dynamic, not only from the volume side. But also when it comes to innovation, because they are teaming up not only between the state and the car companies when it comes to subsidies. But they are also teaming up between the software industry and the Tencents of this world with their car makers and they are really dedicated to get a higher market share when it comes to e-cars.

In India, EMS will similarly use existing infrastructure of our colleagues together with (you) guys, to deepen and foster already-existing partnerships. And of course, with possibly new partners.

First of all, I would like to say that we are focusing now on building up and establishing our core business. This is motor insurance. But it's not only motor, it's from the very beginning, also payment protection. We are also thinking about warranty solutions and all the derivates we can potentially imagine. Our initial focus will be on a powerful IT and ops, as I mentioned earlier in my presentation. And from 2019 onwards, we will shift our focus to second stage of collaborations, extending our core business and thus, strengthening our position within the markets.

And starting from 2020, roughly, onwards, we will extend our business model with new partnerships and business models -- modules. All in all, our growth targets contribute to winning further strategic partnerships to mobilize the entire growth potential of our group. Thank you very much.

A - Ritesh Kumar {BIO 19363386 <GO>}

Thank you, Karsten. A very good afternoon to all of you. I think in a true spirit of what we call the interlock business model, I'm looking at 2 out of the 3 here, sort of helping us one on developing some products on cyber. And on solar and we've done that. We've actually got our product approvals for that. So thank you, Greg, for that. And of course, working very, very closely with the ERGO Mobility Solutions and trying to get in new partners. And that's really the advantage of being part of a large sort of business group.

What I would attempt to do over the next sort of 20 minutes, is really sort of talk terms of the digitalisation at HDFC ERGO. And how this has really helped us scale about 30x in terms of number of policies over the last nine years, in a marketplace, which is

characterized by very high volumes but very low ticket size business. And how do we go ahead and sort of make ourselves future-ready.

Now we are 51-49 joint venture between HDFC group and ERGO. I'll not talk in terms of ERGO. But HDFC is amongst the large financial services conduits in India. And it's the largest when we rank it in terms of market capitalization with a market cap of over EUR 100 billion on last count. The group is across all arms of financial services, be it mortgages, be it banking, life insurance, general insurance, asset management, the entire works. And so we are really across the entire spectrum sort of per se.

Our company was incorporated in 2002. ERGO joined us in 2008. In 2008, we were a very small company. We were at 0.8% of the market share. I often say that we were eighth in the private sector because there were only 8 companies. So over the last nine years, we've been sort of fortunate in growing at a CAGR of 44% sort of against an industry CAGR of 18%. And what that means today is that where we are roughly about 4.9% of the overall P&C market as of March 2017.

In India, our accounting year is April to March. So whenever you see numbers called -- when we put it as financial year 2017, it's the year, which has ended as of March 2017. So please bear with me on that. And our sort of share in the private sector is at a 10.4%. Profitable growth is at the core of our sort of business philosophy. We've -- our profits have grown consistently over the years, as you can see. And today, we have the second best combined ratio in the market. And our return on capital, our return on equity in the vicinity of now 25% for the last few years.

Last year has been a milestone year for us. We became the first insurer across both the P&C and the life segments to actually acquire another insurance company. When we concluded the -- successfully concluded the takeover and merger of L&T General Insurance.

India is today amongst the fastest-growing sort of large economies in the world. I mean, coupled with that, we are a fairly young, sort of, country. All sorts of numbers on the population. I mean, whether on one hand we say 65% of the Indian population is under 35 years of age. We put another statistic here, where we've said that we've got almost about 0.5 billion population in the 15 to 34 age band.

The average age of Indians, by 2020, is expected to be 29 years, much younger than some of the numbers that we put in for the comparable countries. On the other side, we've got almost 1 billion sort of mobile users, almost about 450 million internet users. The Internet usage is growing at a fairly rapid pace. Almost about 90% of this usage is being accessed through smartphones.

The smartphone penetration has reached about 1/3 of the population. It's slated to go about threefold. This is what the publicly available data says. I mean, my guess is that this increase will be much faster. And the reasons are very simple. Today, we are able to get a smartphone in India for about EUR 20. The internet access cost or the data cost is just about EUR 2 a month.

So we are talking in terms of very, very different dynamics. So while today, we may be the second biggest, sort of, smartphone user based after China. I mean, probably the situation would change very rapidly. And the combination of these 2, young population and, sort of, low smartphone costs and, sort of, database cost, would really mean that the Internet users and the usage would significantly increase. And as a company in the marketplace, we will really need to be aware of this and this must shape our strategy as we move forward.

Talking in terms of the non-life market. So as I said, the market has grown at about an 18% CAGR, over the last nine years. Much faster than the nominal GDP growth rate, which has been growing at about 13% over this period. And this is the data not only about the last nine years. But even when one wants to look at the last 15 years. Almost on a consistent basis over the last 15 years, last 10 years, last five years, no matter what time scale that you look at it, it's basically a number which has been growing at between 300 basis points to 500 basis points over the nominal GDP growth rate.

And which makes us, I mean, you have far more people who have a belief that the Indian economy would continue to see robust growth rates. And therefore, the logical extension in terms of what it would mean from an insurance standpoint would follow. Our penetration on the P&C side on the non-life side is low at a 0.8% to the GDP. And when we compare it with the Asian average of 1.8% or the global average of 2.8%. And this is also significantly, sort of, led by the fact that the rural penetration, I mean. There are no real, sort of, hard facts around that. But our estimate is that the rural penetration is just at about 0.2%. As an industry, the nonlife industries issues about 160 million policies every year. I mean, a fact that I have not stated, we process about 20 million claims every year.

Our average ticket size is slightly over EUR 100. And essentially, what this means is that, I mean, we are basically in a market wherein the whole volumes of transaction is very, very high. Also given the fact that rural penetration would drive future growth, this would basically mean that the average ticket size is largely going to stay at the same level.

Given the low ticket size of the policy vis-a-vis, for instance what we see here in the European context, it's obviously very important for us to manage the cost of policy issuance. And this is really something which is very, very critical. And given the high cost, which one would see in a manual issuance, I mean, it logically, leads to the fact that we will need to really look up to technology to keep our costs low.

And this is really how we came to the title of the presentation. That technology really, in the Indian context, is a must-have sort of in a marketplace which is really characterized by very, very high volumes but low ticket size. This, obviously, gets further accentuated when you look at the vast geographical expanse of India. I mean a country with a 3.2 billion square kilometers of area, north to south, 3,000 kilometers, east to west 3,000 kilometers. And this really sort of underlines the importance of technological.

India has about 10,000 towns and cities; in fact, over 640,000 villages. So big challenges on logistics. And we do have a pan-India distribution. We have presence across 30,000

locations. We issue policies in about 5,000 city, towns, villages. And this we do through 112 branches. And another, as of last count, 103 one-man virtual offices.

So the shading, if you are wondering, the shading basically indicates the concentration of policies. So the red is where the concentration is higher, yellow is the next and I'm moving into the shades of green. To give you an idea of our scale on our 24/7 basis, every minute we issue about 12 policies. We handle about 1 claim and we get 2 calls in our inbound call center, which we attend in 10 different languages. I mean, India has a lot of languages. And if you have to be closer to your customer, you cannot say that we will only attend to calls in English or in Hindi. We'll have to go regional as to sort of to that extent.

Obviously, our multi-fold increase in scale. And I've spoken in terms of the 30x growth, it has only been made possible because we've sort of embraced digitization effectively by focusing on: a, consistency of quality, on speed of response and obviously, better engagement with our policyholders. And also very, very importantly, in a retail environment with our channel partners. Okay. So what is it that we are really doing on digitization and sort of essentially a scalable business model, which is efficient given what I've shared with you in the preceding slides, is something which is very, very important in a very, very competitive marketplace like what we have in India.

And primarily, we've identified these 5 business levers or 5 operating levers on digitization. The first one is automation. Basically, how do you go out and maximize you straight-through processing. Adopting the mobile first, architecture, I mean, no points for guessing why? There's enough data to really -- in a way, we are really saying that the conventional desktop has been given a go by and we actually have had to leapfrog to the mobile first architecture.

Providing convenience of self-service to customers. I think that's something which is very, very important, not only governed by what we want to do but largely governed by the larger ecosystem and what's happening across other lines of business. Predictive analytics, I mean, it's very, very important to use predictive analytics to improve the portfolio quality and also for the micro segmentation of our customers. And of course, very, very important to sort of stay up in the curve, look at digital innovation in order to be future-ready at all points and times. So what I will do is that over the next 5 slides, I will spend a slide each on each of these 5 topics.

So automation. So over the last 10 years, we have been automating our processes, maximizing straight through processing. The idea is really how do you go out and limit manual intervention. And this is also very, very importantly helping us keep pace with this significant growth that we've seen over the last years. So just to give you an idea, I mean, in 2008, okay, this is when ERGO came in and this data is not there on a slide. As a company, we were issuing 190,000 policies, okay. Last year, we issued 5.6 million policies. But at that stage, only about 29%, there is an issue around the rounding off. So please bear with me. But 29% of the total policies were what was in a straight-through processing mode.

Last year, 87% of our policies were in the STP mode. Importantly, if we just do a comparison of 2012 with 2017, in 2012, as a company, we issued 2.8 million policies. We doubled that in 2017. But the number of incremental manual policies over this five years when we added another 2.8 million policies on an annual basis, was only 200,000. And this is really something which, otherwise, what would happen is that on one hand you're scaling up, you're looking at distribution, you're looking at the product challenges, you're looking at what do you do to the claims. Because in India, the level of deductibles is low and therefore, the claim volume is high.

You'd also be very, very worried as to how do you process all these policies. Also out of this 5.6 million policies, we got 1 million policies which are customers coming and either buying online or renewing online. So it's almost about 18% of our numbers which really come in and through that.

We created a very, very strong plug-and-play architecture that basically allows us to integrate with the various kinds of channels that we work with whether it is banks on one side, brokers and OEMs on the other side, a retail agent, a web aggregator, as the entire works. And all our core applications and processes have basically been built keeping the scalability in perspective. I mean, if we've been able to grow from 190,000 policies to 5.6 million policies, obviously, without getting into talking in terms of our making future-looking statements. But obviously, the ambition is to really sort of grow there.

Moving to the mobile-first architecture. Given that the ever-growing smartphone user base, we've adopted the mobile-first technology. And we've started building all our solutions around mobility, a different kind of mobility from what Karsten was talking of. Our sales force is able to manage their portfolio, as also the channel partners, using the mobile app whether it is in terms of business numbers, what's happening to their renewals, leads, all the necessary alerts.

In terms of micro-insurance, whether it is crop insurance or cattle insurance, I mean, our people need to travel distances for that. And this is really something which is helping there as well. And so that's something which is very, very important. Our channel partners have the agency management system, wherein on the go through a mobile or through a tab (sic) (tablet) at our customer's place they are actually able to give them presentation on the product, sort of give a quote, issue a policy, track claims for them. And the entire works, which is there.

We've been using mobile apps for our claims. So we have mobile apps for our motor pre-inspection, for our motor claim survey. We also use mobile apps for our crop service. In one of the earlier presentations there was a talk of drone. We actually fly drones to get an advance intimation in terms of what's happening or in the events that there have been instances where the fields have been flooded, to basically get an idea in terms of what is really the extent of damage to the fields.

We also have a customer app, which we call the insurance portfolio organizer. What we will essentially do is that we will run a video wherein we would showcase the insurance portfolio organizer as also the motor claims survey.

(presentation)

We've actually been very, very enthused about on things like this survey because comes with them to of our time lines, improve the quality of the service. I mean, it's basically been a significant improvement that we've seen.

Okay, coming to self-service. I believe convenience, choice of time and instant fulfillment time. I mean, these are things, which have become very, very important to today's consumers and these are really things, which are increasingly driving the consumer behavior given what is happening in the larger ecosystem. We've built self-service applications for the customers, on the portal, on the air, through the IVR. And this is really something wherein we are essentially saying that a customer can come in and do a host of self-service features on his own.

In the video, you have obviously seen how he is able to do this through the mobile app. But everybody does not want to download your mobile application. Therefore, they can equally come in do this either visiting the portal or on the IVR. When we talk in terms of the IVR, a lot of times people really do not want to wait in the queue to -- for a call center agent to pick up.

And therefore, what we've gone in and increasingly introduced is a lot of those things on the IVR wherein people can come in and fulfill their transactions just through pressing a few buttons. If they want a copy of the policy, they want to register claims. So some of these. And this is really something that has picked up.

We've seen reasonable traction and in a short period of about a year, we've actually seen the total amount of self-service requests, which have been fulfilled through the self-service -- the requests, which are being serviced through the self-service mode increased from 2% to 12%. And we feel that this is something, which can really increase and these are all sorts of service requests. Also importantly, I mean, you will know if you look at the left bottom, there are 2 others graphs which are there. One is basically saying that using the self-service, 28% of our private car renewals today happen online. So this is not shortchanging the channel. The channel get the credit. But this is a service feature that we've built in. And so this was 28% number for the entire year. And incrementally, this number is 32%.

The other thing, of course, is that we've also pushed our garages in India. A lot of claims intimation actually happen at the garages or the workshops. I mean, we don't have a fault policy in India. And therefore, it is possible for a policy holder to, basically, drive the car to one of the garages and from there, the garages really notifies the claim. And we've actually gone in and seen 57% of those notifications coming in through the app. This is very, very important because otherwise the time that the customer is calling is actually the time that the workshop is also calling. And which is, basically, your time within 9:30 to 11:30 in the morning.

So moving on, on the predictive analytics, I mean, this is really something that we are using in a significant way. For portfolio steering, for identifying growth segments,

understanding customer behavior and their propensity to buy, renew, cross-sell, up-sell. We are also using this in the area of fraud and analytics and I will talk about this. So on the first part, where we are obviously using predictive analytics to be able to estimate the impacts of our various decisions on the performance of the portfolio.

I mean, in the good old days, the way it would happen is that you would have one tariff. Then you will wait for 6 to eight months to start seeing the trends. Then spend another two months in trying to fix the problem. And by that time -- and then you have to wait for another year for the issue to be resolved. So the response time was slow.

Today, we are actually able to have a predictive loss score on an underwriting month basis. And therefore, this -- we could do it on a weekly basis or on a daily basis. But of course, the data needs to be -- our monthly data would statistically be more relevant. The second use is really in the area of customer segmentation. So it helps us determine what to pitch to whom. In a classical sense, we've actually used this quite well in an intervention for our renewals.

So earlier, we were approaching all customers in a similar fashion. We use analytics tools to divide the entire renewal base into deciles. And basically, saw that in the bottom 3 deciles, this is targeted intervention. We were actually able to push up renewals by 14 points. So it obviously. So it's not only about who do you target for a fresh sale? But very, very importantly in terms of how do you retain the customer. And moving forward, significantly for the cross sell and up sell activity which would be there.

The other area that we use it, significantly, is for fraud control -- on fraud control engines. We build static rule engines, we build some dynamic rule engines. And this is -- this really helps us. We've done that on motor. Recently, we finished it on health. This is really basically saying that when a -- when our policyholder calls at the call center or when, in the case of motor, the garage calls, this is really -- the data is really being processed through depending on the facts, through these static or the dynamic rule engines.

And if the score or the fraud score is high, then there is a different bucket through which the entire thing goes. And we see fairly interesting levels of positives, which happen through this. And this is what enthused us to then take it forward in health, wherein we created something on our own and likewise sort of see that.

And coming to the last slide on digital innovation, you can't have a presentation on digitization and not talk in terms of innovation. So obviously, I mean, the fact remains that the pace of innovation is extremely fast. And I mean no matter what you do, this is really something that you have to try very, very hard to stay ahead of the curve. And the challenge always is that how do you go out and improve customer engagement. We've created an innovation lab as -- in our company so these are dedicated guys who are trying to explore technological advances in different tech space in addition to what -- the support that we're getting from ERGO.

I mean, we've done some of the initial things on chat boards, on robotic processes automation. Some of the initial things on voice analytics. So we are using chat box then in

a slightly different way. The conventional one that people always talk the chat -- talk about the chat bots is that a customer comes in and he's basically being responded to by the chat bots. I mean given the whole issues around languages. And I said that we take calls in 10 languages. And therefore, we need to be -- slightly be mindful of how this can really happen.

So what we've basically been using the chat bots for. And we named our chat bot Aby. So what Aby does is that it really goes out and assists our call center agents in making him through a guided call. So when our customer calls up, I mean I was told that on last go, we had some 198 different kinds of processes with the call center agents were trained to answer.

So we have got some 80-odd products, the different things which happen through that. It's really complicated and one of the clear fall outs is that the turnover rates among the call center agents is high. They would rather work for simple industries. I didn't want to say that. But Mark helped me say that yes, telecom is a simpler industry.

But so a, we are actually able to reduce the training time. Our agent is much more equipped and the way this entire things works is that it helps the agent ask the right questions. And at the back end, depending on the decision tree, the -- Aby is really processing that data. Also going back into the system and doing things of a classical case of -- so the ownership of the vehicle has got transferred because the new person is -- the new buyer is calling up to say how do I transfer the policy. This, I'm told, is the complex process in the call center. And therefore, this was the first test case that we used.

And including going in the back end and telling what the premium should be. Everything is done and within 5 minutes for a process, which was typically taking almost a week. Because there would be things you would log on, do a request and then you would send them data. The customer would look at it at his convenience. Here, while he's on the call and in just about 4 to 5 minutes, the entire call is concluded. We -- so a, on one end this happened. Obviously, this helped us in taking our NPS scores high. So this has been there. The other one that we have been using is we've been using robotics for policy issuance for our bank insurance portfolio. And so with the help of robot there. And we've called it Rambo.

On an incremental basis, we are actually able to process 150,000 policies per month. So we'll get a number of files from our channel partners. And the typical way it was happening was that these files would come in and then you would have a set of people who would sit on these files, massage the data, make sure that all the fields are filled in. In case they are some fields which are empty or the fields are not properly populated. Then go through a series of steps to upload that and press the right commands and do that.

Today, all this is being done by Rambo. And what this does is that this has reduced our processing time by 87%, okay, which is there. So as we talked, we are now seeing as to how do we put some of the simpler processes. So our next area that we are really exploring very, very closely is in the area of finance and operations and how do we go to the next level on that.

Of course, the other interesting technology that we are trying with and we've actually completed a pilot on. And this is something which should really be going into production fairly quickly as the voice analytics. And so this is really something which will help us get deeper insights into the call center performance. I mean, no matter what you do, I said that every minute on a 24/7 basis, we get 2 calls in our call centers. Now how do you a 100% check on those calls? It's impossible.

But through voice analytics, you are actually able to do that. And this also helps us in understanding the customer sentiments. Was he irritated when he called? Probably at a future date, if he senses a hint of irritation, it might go to the level 2 agent instead of the level 1. So a lot of things which are there.

We've -- as we speak, we, apart from English, we've already started -- we've been successful in understanding this for to -- the Hindi language. But of course, we've got 8 other languages to get to as we progress. Okay. Now obviously, a lot has been spoken on machine learning and on artificial intelligence that obviously, would logically be the next course.

So we've essentially, I think to summarize, I think what is very, very important is that if we have to stay relevant as a company, we will have to invest and continuously look at digital innovation. And this is something which is of paramount importance.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Thank you very much. Now for the next round of Q&A. Who is first? Kamran.

+++qanda

Q - Kamran Hossain {BIO 17666412 <GO>}

It's for Daljitt on cyber. I guess the 2 main concerns that we hear from cyber buyers is actually there's a lack of capacity and the scope of coverage isn't that wide. Can you talk a little bit about what you expect to happen to profitability? Because I guess, ultimately, what you said today and what we've heard in a number of occasions from other players is that profitability is very good. But the product doesn't pay out when people need it to because you've got this really limited coverage. So will kind of coverage become wider? Or will prices come down? Or what do you see as being the end result?

A - Daljitt Barn {BIO 20704654 <GO>}

I -- one of my slides showed how coverage is already expanding across the lines for cyber. An example I used last night was from SME perspective. So some issues SMEs have had, have been around maybe their money being defrauded from their accounts, which is traditionally a fidelity issuer crime policy. And the cyber insurance industry has actually put into product to help address that immediate need. Clearly if it scales up to some of the larger risks, we've got to be careful on it not confusing the client on actually, is it already covered in some other lines of coverage, in their other policies. But profitability is good. Most of the -- kind of across the board, the industry would be somewhere around 42% loss ratios. Combined ratios 80, 85 is what we look for. And there will be some carriers

who came into the market and were unfortunate and had a few very big losses. And they're the ones that propagate where it doesn't pay or they've had some bad experience. I think, in general, the losses that have been in the public domain. So open source types of around Target stores, even Equifax, the insurance industry will pay the tower, yes. The problem is they didn't have enough insurance, yes. So from a regulatory capacity thing, I think there is plenty of capacity for in cyber. There's more and more entrants. Even in -- because we do proportional quota share on reinsurance. So we do primary, we lead in some of the prime retailers. But if you look at somebody -- and I think largest (ever) insurance tower is about 550 million, okay. And that was for a financial institution. If somebody wants 600 million, 650 million, 700 million, the insurance market will be able to insure it.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Ivan, do you had a question.

Q - Ivan Bokhmat {BIO 15378004 <GO>}

My question is on the PMLs that you mentioned. I mean on your current premium base, can you disclose what would be the highest one? And I'm just wondering, how will it change as we approach the EUR 800 million number that you mentioned as your aspiration?

A - Daljitt Barn {BIO 20704654 <GO>}

I can't disclose what those PML numbers are internally. But I think we -- because we continuously look at those models and we are -- and our risk appetite is driven by that's our foundation block of accumulation. We will continuously test our own models. But also externally look for partnerships to either get access to data or more probabilistic scenarios to be able to benchmark and test those. So this, I think, I'd call it a bit of a space race. So whoever in the external market, be it RMS, be it Verisk, whoever, comes up with a really good probabilistic model, I think the industry will then try to embrace that.

Q - Ivan Bokhmat {BIO 15378004 <GO>}

Question. Thinking about the, for example, for the group, the largest PMLs, I think the third-largest that you disclosed is 2.3 billion of the European storm. How large would the cyber business need to become to be able to one of those top 3 perils?

A - Daljitt Barn {BIO 20704654 <GO>}

Okay. That's a difficult question to answer, actually. Our ambition is to get to 10% market by the end of 2020. The board have agreed what the overall PML would be as a threshold. We're not within any kind of -- if you think of green, amber red, we're not towards -- we're in green; we're not in amber. And that's kind of the approach we take across the other PMLs. I think if we continue to hit those numbers, year-on-year CAGR, I think we would need to have significant losses for that appetite to change. And as an industry, as you know, there's not many losses.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Okay. Guilhem, please. And then Roland.

Q - Guilhem Horvath {BIO 18460437 <GO>}

Yes. So the question on cyber and I guess you partly answered that already. But just going back on your ambition of having 10% market share in 2020. I'd like to know a little bit how you got there? Is it only about PML and capital consumption? Because on the one hand, you seem quite optimistic on the opportunities for these markets a little bit more than some of your competitors. So it would mean that potentially you are willing to get a little bit more exposure than the 10% market share. On the other hand, you also described that the risk, the underlying risk, has already quite changed quite a lot over the past 2, three years with the ransomware, et cetera. So how are you confident -- how confident are you that in 2020, you will want to have 10% of the market and not more or less? This the first question. And the second question is on the modeling agencies. Do you see already this kind of models being (taken) by modeling agencies? And potentially the risk for some alternative capacity to enter these market? Because there are some similarity between nat cat and cyber. Not all of them -- not everything is similar but there are some synergies. So how confident are you that you're not ahead of a softening market such as the one we're experiencing now in nat cat?

A - Daljitt Barn {BIO 20704654 <GO>}

Okay. Let me address the first one. So we -- at each point across the -- from now on until the end of 2020. So we'll look at the results in January. Initial indication is that we'll beat the number that we've written as a strategy. And some of that growth is organic so, as I mentioned earlier, that our reinsurance clients. So the main carriers in the cyber market continue to grow. We grow with them because it's proportional. We've also, through the HSB model, which is assumed, that is still growing. There's more and more carriers. Our CEO is at the back there. So that's a model that we can actually lift and shift across from U.S. to Europe and actually even work with this intellect business model phrase you've heard before, is even work with ERGO to look at their distribution, okay. And push that model out. Then I think there is our ability to white label which we need. So that may not get us to 10%. But we need to that look at alternative markets and enabling all the carriers to also write cyber. And I think that's what built into the hockey stick. If we do more of that, that's because the cyber market has grown more. So our assumption is, it will be somewhere between EUR 8 billion to EUR 10 billion by the end of 2020. If it happens to be EUR 10 billion, we'll have a EUR 1 billion premium. But the focus here is to continuously look at how we can leverage the group. But also then how do we work more closely with our client base and distribution to actually see other opportunities. And they're changing on a -- if not a monthly, 6 monthly basis all the time. To your alternative capital, I've been to various conferences, even in London, kind of where the alternative capital market are very interested in cyber. And I haven't seen many of them enter. But they're very keen to do something with it. The -- an example I would give is, we were offered a piece of business where our approach to cyber is, as I mentioned, quote to share proportional. Because that's where you can help the seed and grow with them, okay. So in good times, you both benefit, in bad times, you're there standing next to them. If in cyber you suddenly want to start and do excessive loss, you're just creaming off the top. You may get a better rate online. But actually if there's a few losses, you're the first person to exit. That, I think, is where some of the capital markets feel there's opportunities. And we were offered an opportunity to help build to a tower up to $1 billion, okay. So this particular

insurance carrier felt they could get to maybe $700 million by themselves, by the insurance market. But then they would need providers to take $300 million slices to get to $1 billion. But that would have been excessive loss. And they were -- one of those was a tech institution, the other was capital market. So there are ways to enter. But from my perspective, they would rely on somebody like Munich Re to say what is the real peril of going that far up, looking at those limits.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Roland?

Q - Roland PfÃ¤nder

Two questions on HDFC. Could you speak about the development of the combined ratio throughout the recent years, maybe decompose it in expense ratio, loss ratio, impact from your technology implementations? And secondly, I would be interested in the customer churn rate. So is it more driven on price? Or what is the impact on branding in your country?

A - Ritesh Kumar {BIO 19363386 <GO>}

Okay. Talking in terms of the combined ratio. So for the six months ended September, our combined ratio was 99.8%, okay. Our combined ratio last year for the year ended March 31, 2017 was 100.7%. This was because we had also merged the entity that we had purchased, whose performance was very, very poor. So excluding that, our combined ratio was at a 99.6%, okay. So this is really the combined ratios for the last two years. The year before that was higher. It was sort of in the 3 digits. This does need to be compared vis-a-vis, say, the industry-combined ratios of about 110, 111. And as I had mentioned earlier on, ours is the second-best combined ratio in the marketplace. The loss ratios in the Indian context tend to be slightly higher. So while I don't have offhand the segregation between loss ratios and the expenses. But sort of, basically speaking, it's more like a 70-20-10. 70 being the losses. And 20 being the acquisition costs or acquisition-related costs, with 10 being the operating cost, okay. So this is one. Your second question was around customer retention and branding. You see in the Indian context, we are really in the HDFC outfit. We have 1/3 of the total mortgages outstanding in the country. We are the largest auto loan provider. We are the largest credit card issuer. We are the largest unsecured loan provider. I mean, we are -- on asset management, there's another company, which is neck to neck. So we are either the #1 or #2 on the total assets that we manage. But these are third-party assets, second-largest life insurance company. So I mean. And the reason why I'm repeating this really is that the HDFC brand is a very, very well-known and a respected brand. A brand which is known for good corporate governance, fairness, transparency and that is really something that we benefit from. So we've not really been spending in terms of, since you spoke of branding costs. I think the sheer fact that our majority shareholder allows us to use those 4 magical alphabets called HDFC really helps us because this is really a household brand in the Indian context.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Next question. Paris, please.

Q - Paris Hadjiantonis {BIO 19703051 <GO>}

Yes, Paris Hadjiantonis from CrÃ©dit Suisse. The question is on Canada, actually. Looking at your market share, it is very big. And if I look south of the border, I do not really need to go many years back to see that experience in life has been actually not very good. So in terms of coverage and products, what are the differences? And why do you think that it is more profitable in Canada right now and you're taking a aggressive approach when it comes to life insurance?

A - Mary Forrest {BIO 15882114 <GO>}

Are you asking me why the U.S. market -- the U.S. reinsurance market has not been as profitable in the U.S. versus Canada? The reinsurance market or...

Q - Paris Hadjiantonis {BIO 19703051 <GO>}

I'm saying why experience now going forward for Canada will be any different given the tale of the business? Then why do you think that it's the right moment to push so hard?

A - Mary Forrest {BIO 15882114 <GO>}

Okay. So I think the answer is different with if you look at the individual life and the group. So if you look at the U.S., I think all of you are very familiar with the old-age mortality issue and the fact that reinsurers are using outdated tables. So that didn't happen in Canada. The actuarial industry has been far more proactive in terms of coming up with more and more up-to-date tables. I would say also there is less competition in Canada. In terms of the group market, again, very different -- the 2 markets are very different between Canada and U.S. So first of all, in Canada, we have public health care, right? So again, that influences the type of products, it influences the buying behavior in the U.S. Even though if you talk to most of our clients that are in group, they're all talking about voluntary benefits. But again, very competitive. So we are going to look at the U.S., it's just that we want to first try it in Canada because it's a -- we still believe it's a more rational market. In the U.S. there is competition for every single piece of coverage. So for pharma, there's competition; for hospital, there's competition, whereas in a group market in Canada, basically a group gives its entire -- all the group benefits to one carrier. So I think the markets are still quite different. And because of our deep penetration and especially in group the fact that already companies come to us for services and products, we feel that we'll be more successful there. So we want to try it there first. We want to build our platform. And in the meantime, we're already in the process of comparing our -- the platform that we're building, compared to what is already out there in the U.S. Does that answer your question?

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Andrew?

Q - Andrew James Ritchie {BIO 18731996 <GO>}

Just one quick question on Cyber. How is Vector doing the Beazley joint venture

and maybe just remind us what's different about that program. I think it's been going on for a year and a bit now. The second question ERGO Mobility Solutions, I mean, I can't help feeling -- I have an app on my phone with -- the underwriter is a large insurance company not very far from here who has done a lot of partnerships auto manufacturers for quite a long time. I'm just trying to judge to what degree you're playing catch-up with them or what's different about what you're doing with some of your competitors.

A - Daljitt Barn {BIO 20704654 <GO>}

Can I do the first? Do you want me to go? Okay. Vector. So that's a -- for those who aren't aware, that's a partnership between Corporate Insurance Partners, one of our business units and Beazley. So Beazley has been -- is already a long-established client from a reinsurance perspective. And in a market, we're focusing on looking at complex risk with Vector. So it's not a transaction play, it's bespoke, kind of underwriting-tailored. whichever word you prefer. So it would be manufacturing, certain banks, those type of risks where they're looking for a substantial kind of tower to be built. And the Beazley lead, we can do up to 50 million each. So Beazley may put the first 50 million down and we follow with the next 50 million or it's vice-versa, Munich Re lead. And there is a -- and it's had some very good traction. But compared to the overall number, it's still a small slice because the lion's share sits in the reinsurance business or with HSB. But we do see doubt digit growth year-on-year with Corporate Insurance Partners.

Q - Andrew James Ritchie {BIO 18731996 <GO>}

Maybe just to clarify, what is it that sells? Because it used to be Cyber was sold on particularly post-breach services, the quality of that, I mean particularly with Beazley. What is it now? Is it limit that people want? Or is it the ability to cope with unusual risk? What is this nature...

A - Daljitt Barn {BIO 20704654 <GO>}

You know, that's a good question. So I think the service wrapper is still very important. So if you think of the paradigm moves, a client without it, the clock is ticking because the regulator, the investor, everybody hit the spotlights on you. It's the same when it's cyber. And it was referred to earlier. If it's a cyber breach and it's covered, you have to be able to say, "Here's the black cap and who's going to end -- who's coming in a black cap?" Is it the friends of these guys, is it the legal experts? Is it the kind of technical, kind of, breach response? That's still very important. I think with Cyber, there's been also an emphasis on how to make it easy to buy, which is -- there's a terminology of outside-in. So there's a lot of vendors in the market that try and assess a given client's security posture based on Open Source. So what is happening from a vulnerability perspective? What is somebody saying on social media? What's happening in the dark web? So that approach has also augmented the underwriting. Clearly once you've won -- once you've got the client, the stickiness is important. So a lot of carriers are now -- especially Munich Re, are focusing on what do we help them manage in their own security posture during the (time) of the insurance and I think we'll see more innovative solutions around that augmentation of Cyber.

A - Karsten Crede

Yes. And you were asking me what is the difference potentially between us and other players in the market dealing with car manufacturers. And from experience, it's all about expertise on the on hand side of the team. And on the other hand side, of the infrastructure you are providing, how good are you in IT, in claims and processes and product development and all that stuff. From our perspective, we believe that the combination of reinsurance and primary insurance provided as an entire fuel towards the opportunities of collaborating with the automotive industry is something very unique. When we go to China for example, the business model is 90% driven by reinsurance solutions. We are providing the local players expertise versus our taking apart of their portfolio, for example. And the team has already been hired so far in the core. So we are really confident that we have a very strong, unique automotive expertise. And in combination with our infrastructure when it comes to data management, when it comes to the software solution which we bought as a standard software, external solution we believe that this combination gives us the opportunity to take a huge share of this accessible market which is, for us, quite significant.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Time maybe for one last before the break. Vinit.

Q - Vinit Malhotra {BIO 16184491 <GO>}

Just on the Indian insurance situation. Yields might be falling in India now and you have a 25 ROE for 100 combined. What's the potential impact on tariffing? Because I remember a few years ago, tariff changes were quite a big issue in the market. So that's just on the Indian situation. If I can have one more question or maybe a couple more just quick ones. In Canada...

A - Christian Becker-Hussong {BIO 19080254 <GO>}

One.

Q - Vinit Malhotra {BIO 16184491 <GO>}

Very quick. Canada's slight 70s, I mean you were clearly more than surprised. You sounded delighted at that, the way it has worked, this pilot. So why are you giving it away as just being an agent? I mean, Munich Re can do more as well. Is that -- has that thought come to your mind ever?

A - Mary Forrest {BIO 15882114 <GO>}

So I'll answer that. We're not just an agent like -- from doing the solution, how we're going to allow clients to take advantage of the distribution is by getting 50% of the reinsurance. So if I -- we look at our projections, it's about 60% will come from Reinsurance business. So we're still a reinsurer, But this is actually just tying us more because they want to use the -- digitalize that agency. Okay you can take this.

A - Ritesh Kumar {BIO 19363386 <GO>}

Okay. Talking in terms of the interest rates and what this means for the (mind issue). You're right, on 100 combined, we had 45.5 ROE post-tax. See ours, as an industry, a one

year business stream. Okay. So it is very, very easy for us to basically sort of transform that -- this entire equation in terms of, I mean, in a decreasing interest rate regime, this was basically have to be countered by improving combined ratios. And impact of 1% decrease in interest rate is a roughly about 1.3 to 1.5 on the combined. Okay. So if you were to. And also given the fact that it is a one year sort of business stream and the interest rate immediately takes about three years. So if there is a drop of 100 basis points, in the yield curve, this essentially takes about three years because you also have an existing book and incremental book. So the whole effect of that 100 basis points takes about three years to come on your portfolio. So over those 3 year period you need to improve your combined ratio by 150 basis points.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Thank you, colleagues, time for a break. We will go downstairs and have lunch together and we should take about 90 minutes so please be back at a 2:45. Why such extended break? Because we want to make use of it in order to present even more projects and products and solutions and services. And we have 4 offers to you. So please make use of the time and make yourself acquainted with what we do downstairs. What we will present is first of all, Digital Health. Health services is the DKV's newest app to provide Digital Health services and the app offers quick and simple access to a digital doctor, health services and invoice app. Second project we present is Data Analytics Suite. Data transformation has huge potential, as we all know. And Data Analytics Suite is a platform for advanced analytical solutions and it allows clients to leverage their data along the entire value chain. That's the second one. The third one is The Box. Automated underwriting, using artificial intelligence. Tariffs are key. But hard, slow and costly and The Box is Munich Re's data centric underwriting engine using external data combined with Munich Re data and artificial intelligence. And last but not least, M.I.N.D. With M.I.N.D., we're processing huge amounts of information on losses, assets and other information on just one platform. And we provide a deeper insight by combining the clients' data with Munich Re expert knowledge and external data in order to better estimate damage and detect fraudulent claims. This is what we have to offer. Please make use of our colleagues presenting their projects downstairs and have a nice lunch. Thank you.

(Break)

+++presentation

So thank you, for coming back on time. I trust you had a good break and good information on what we do in terms of various initiatives. Before we go into the last round of presentations and Q&A, let me just as always introduce 3 speakers of this afternoon.

Starting with, Greg Barats, he's the President and the Chief Executive Officer of HSB. A company you're familiar to quite some extent. Greg holds his position since 2011, HSB has insurance and engineering affiliates worldwide and is a world leader in equipment and special risk insurance for commercial, industrial and personal line sectors.

Greg's career so far, bridging engineering disciplines with technology and financial tools to solve business problems. Greg has a scientific background and from 2001 to 2008,

Greg served as a President and CEO of HSB Solomon Associates, a global energy management consulting company. And from there, Greg moved to lead HSB Group's engineering function until becoming CEO. He has been responsible for Munich Re Group's overall commercial, industrial, IoT strategy since 2016. And he will cover the Internet of Things area today.

Andy Rear, Chief Executive of Munich Re Digital Partners. And of course, he will talk about his own business. He joined Munich Re in 2010, leading the Asia, Africa and U.K. life businesses until May 2016, when he took up his current role. Digital Partners is a global business working with and investing in startups, digital, verticals and the sharing economy. With the ambition of building a more engaged proposition for insurance customers. Prior to joining Munich Re, Andy, was partner and head of the EMEA insurance practice at Oliver Wyman.

And last but not least, John Paul Pieper, CEO of nexible, he will talk about nexible, ERGO's pure online insurer. John Paul is holding a degree in economics. He started his career early on in telecommunications at Vodafone Germany, where he held various management positions across sales, marketing and operations.

Afterwards, he joined Vodafone Group enterprise in the U.K., as global head of sales, operations transforming the entire function towards digital technology excellence with the customer at the center.

Gentlemen, please go ahead and if I may ask you to start Greg, okay. Greg?

A - Greg M. Barats {BIO 17365510 <GO>}

Thank you very much. Greg Barats, Hartford Steam Boiler. I was asked to give a little promo intro on who HSB is a little bit. Hang on here. So I can get this going the right way. There we go. Let's just kind of go through the numbers very quickly. HSB was founded 1866, 150 years -- we were -- we celebrated our 150th last -- just last year. We've been through 3 industrial revolutions. It started with steam and water, it went to electricity, then computers. Now we believe we're on the verge of the fourth industrial revolution of Internet of Things, which I'll talk in greater detail as we move along with the day. We were purchased by Munich Re in April of 2009, after the 2008, from AIG.

We've had strong performance with the 2000s, you can see by our revenue, gross written premium, our combined ratios and ultimately what translates to a tactical underwriting result here.

We're a very unique company and, I think, it's important to kind of talk about this just for a little bit. We are 2,500 employees, half the company are engineers or technical in nature, which is unusual in the insurance industry. We have a sizable engineering service business.

We started off being really engineers first that got into the risk in the insurance side of the business. So we kind of approach things from a very technical standpoint, which is really kind of morphed us into kind of who we are today.

And I seem to be the one challenged here with the -- so talk to a little bit about us today. We're a specialty niche provider in the industry. We use our engineering and our comfort with complex risk to basically drive new products, which has led to a wide range of specially products and if you look on the left side of our diagram here you can see the kind of the makeup of our revenue. 69% of our business comes from equipment, we're equipment specialists. That's very traditional. But that, if you went through the past, it was much larger. It was more like 85% to 90% just 10 years ago. We've made a big push in the specially risk area, it's growing annually 22% for us. Then we have 13% of our revenue comes from our engineering fee business.

On our engineering fee business, these are engineering services that we sell to industry. These are not insurance-based -- insurance-based related engineering services. So these are engineers of manufacturing or energy companies that essentially provide -- that are looking for services. So for example, we work with over 25 -- 3,500 manufacturers in the world in terms of providing inspection services for building of -- as they construct their pressure vessels and other related equipment and we also benchmark, for example, 90% of the world's refined capacity.

So we have a benchmark in practice from the wellhead to pipelines to terminals to refineries to petrochemical and also offshore platform.

It's really probably -- Solomon Associates are probably the gold standard in the energy industry for benchmarking services and also management consulting fee services. We translate all this information and knowledge and expertise into our core business, our underwriting, which gets to a wide range of products that we bring to the marketplace.

We obviously, we drive -- we write direct through agents and brokers, what you can see is there for "S" for single risk. But a sizable part of our business is called portfolio business where we have over 300 treaties with insurance carriers. We're kind of the "Intel-chip-inside" where we take a specialty product, put it inside the package of an insurance carrier and act as a primary within that. We do all the underwriting, we structure the product, we do the coverage, we do the training, we actually ultimately deliver the result. I think, that's important as we talk a little bit more here as we go on.

We've always been looking out to the future of emerging risk and this is kind of very -- been historical to the company and if you go through our history, we've made investments in a wide range of different technologies through our history and once we were purchased by AIG in 2000. And then 2009, we went to Munich Re, we stepped back and we got back into our roots. We started a corporate venture fund, we took $50 million, more investing in technology firms. That we've looked to technologies that are basically what we think are driving the landscape in the future for the core part of our business and that again, is the Internet of Things.

So that brings me to what we're doing in that space. Right now we have -- we brought 2 groups within Munich Re. HSB started over about 4, 4.5 years ago, diving into the details of IoT; Munich about 1.5 years later. And what we found is that we just need to bring these 2 groups together, kind of coordinate our efforts.

We have 70 employees right now with 3 centers that we're focused on, the 3 areas that we have our staff that's working on this space. Munich has one core staff, another one's Hartford, Connecticut and another one's in Austin, Texas. This group is really testing, we're testing technologies, we have interrogated over 200 different technologies. We're looking at IoT platforms, we're looking at business models, we're looking at the -- talk with the customers and seeing what's the real benefit that they can derive from this. Where's the cost advantage? Where is that tipping point between cost and benefit? Who pays?

Looking at the difficulties of what you're doing here on IoT, particularly in the commercial industrial spaces, you're solving physics problems, you're solving time, space and connectivity. And from -- and what makes the commercial and industrial space very challenging versus telematics or home, which can be relatively homogenous, I mean, you have a car with 4 wheels and a steering you'll and you have a home that's generally structured the same.

We get to the commercial and industrial space, you have hundreds of different businesses in occupancies and thousands of different configurations and so that the technological challenge here can be quite large. So we have a big group just devoted to moving this forward.

So let's just talk about -- we say Internet of Things. What is that? That's really the inner connection via the Internet of computing devices attached to physical objects. And so you're basically having physical objects exchange digitally information between each other. You can put algorithms so they can change their activities or they can send you signals and alerts that make you aware of something that's coming on. That's really what IoT is about.

And I mean, I could list here -- we listed a few consulting firms, kind of the size the market, kind of the expectation of the growth over certain period of time. I mean, I think, anybody here, any numbers we'd put up there would say that no one's right. But I think, the general direction that you can see here is that the market is very large. And it's quite sizable.

And when you take all these industries, you take the commercial and industrial space, the area that's got the biggest focus and that we can -- in the short term has the most immediate impact, is really manufacturing. And that's really here in the middle part of the diagram, you can see the economic benefit in the manufacturing space is quite large.

And what they're IoT for, is basically to enhance their business. They're looking to basically reduce downtime. And they're looking to increase productivity, they're looking to improve quality. Lower cost, create higher flexibility and all these things basically will impact the overall risk exposure of this site and facility as well. And they also create completely new risk and also new opportunities for new insurance.

Now, I think, there was a question that was asked earlier that they said there's a dÃ©jÃ vu from 2000, there's innovation. You can say there's dÃ©jÃ vu with sensors, I mean, if

you've been around for a while, sensors have been in the energy industry since the late '70s and the '80s with refineries in particular.

Fundamentally, what's different, why this whole thing is just exploding right now -- there's a kind of a little bit of a perfect storm that's happened here. First of all, it's really the Internet, how it's been embraced and just absorbed by everybody on a global platform and it's very affordable bandwidths. This has moved to very, very cheap hardware. Cheap hardware has really come down and then now you have, essentially, Big Data tools, an ability to digest and organize. So you can take this huge amount of data and actually drive it towards a meaningful result where you can drive an economic benefit.

And really maybe the last part of this little piece of the puzzle is a really smartphones and your iPads and your laptops. I mean, this has now put all of this incredible amount of information, detailed at the tip of the finger of a business owner or a plant manager or an executive of a thing. So this has really, really exploded this marketplace.

The one thing that can slow it down, that can put a bump, is really security. The security of these systems because they -- now you have an enormous amount of new gateways for cyber-related type of activities that can impact the business.

So moving to the next slide here. As I was talking earlier, you have this connected world of physical objects. And I think, it was Gartner, a few years ago, I think coined the term and I thought it was a very good term. When you have a -- you connect all these physical objects and you're giving almost near-perfect data on a real-time basis and you're managing events and you're signaling before they happen, you're basically managing business moments and these business moments are opportunities for someone to avert an outcome. And so there's numerous studies that have been presented and I'm not here to put the percentages. But it's very clear that this will impact insurance without a doubt.

You'll lower the frequency and lower the severity of a wide range of events that happen in the marketplace. So this is really a challenge for the insurance industry. They're going to need to step up and find, how do we replace this lost revenue and actually exceed beyond that with this movement of IoT -- Internet of Things across the commercial and industrial space.

There's a wide range of different service ideas that can be brought forward and there's a wide range of new products, or new related to insurance -- related tools, that can be brought forward as you essentially, as you create these -- this new environment, you're creating new risk and you're creating new business models that have opportunities as well. So this is a challenge for the industry and this is why we have a significant amount of interest in this space.

So let me just talk very simplistically about what we do and if we talk to the commercial space, let's just kind of walk through an example. And a very simple one. But this is the retrofit world. You remember earlier when Marcus Winter had passed around that sensor to everybody. That's really kind of 2 worlds here for IoT. One is the retrofit, where you're attaching sensors to something to take readings and temperatures and measures. Then

there's the other one, the integrated world, where sensors are actually embedded in the material or they're embedded in the equipment -- they're part of that actual sale. We're going to be in the retrofit world for quite a while because no one is going to take a good piece of equipment or good piece of material and throw it out the window because there's a new piece of equipment that's coming in that's got some really cool sensors in it. That's not how businesses go. They work and they drive that equipment -- and you own those materials, as long as they can go. So retrofitting brings the digital world in to be able to help solve those problems as the integrated starts to catch up with it.

So I'd just give you a small example. I mean, we have one of our partners, one of our (treaty) partners, an insurance carrier come to us saying, we have a significant amount of water losses and frozen water -- frozen pipes in churches.

I mean essentially, a church, not to offend anybody, is like a warehouse. It really doesn't have a lot of occupancy, not people are there all the time. So there's a lot of time where this occupancy is not being attended to. And so it's a commodity priced occupancy. But they have a significantly high frequency of losses in water and frozen pipes.

So they wanted to tackle this challenge to see if they can lower this frequency and severity and basically change this commodity pricing -- or this commodity value that they bring to customer. And really the approach we did we started with the proof of concept, we sat down with 20 churches, we essentially sensored them up with a wide range of different sensors because we wanted to test different technologies and see which ones work and see the different cost points and then from that learning, we moved to 250 locations and then ultimately now we've moved to 10,000.

And each step along the way, we've proved the cost-benefit of this technology such that, it could scale to the point of 10,000. That's just one insured, one occupancy, one risk, right, that they're looking for. Then from this, we've developed algorithms. And these algorithms are very powerful because now we can actually send -- as we send signals and alerts to a condition that's brought itself to a church that something needs to happen, we can also send that same signal to alert the similar facilities in the local area, that are not sensored to basically take a similar response.

So it's amazing how the algorithm not just basically -- built and developed actually solved that one occupancy. But surrounding areas that become powerful enough that we can signal there.

So working with the customer we work through understanding their customer needs, what the risk is. We build some mobile apps so now not only are we sending the signals and alerts. But now we can push information to the customer. We can send like weather information; we can send risk management information. We can send new products information; we can send information on new sensors that can help optimize their business, or their activities.

And so, this starts to create a very strong value proposition between you and your client. And so that stickiness or that differentiation now starts to come through. So you've

lowered the frequency, you've lowered the severity and you've now -- you're not in a commodity position within the customer.

And so this is actually been, as I said, very powerful -- a very simple. But very powerful example. We're doing this now in 16 different occupancies across 20 other customers.

On the manufacturing side, this is a nice little slide from McKinsey, if you want to pull it up. We talked about earlier the significant opportunity that exists within the manufacturing, they just highlight 7 main areas that IoT is being used to drive, as I said, uptime or higher yields or better efficiencies to basically drive themselves into the new digital world.

And really the 3 most significant ones here really are the real-time production dashboards. This is where you basically sensor up the production line. You're getting real-time information from your machines and your process, your inventory and you're adjusting your overall production line in a real-time basis without having to slow it down or shut it down.

And this is where -- this is the #1 business opportunity for manufacturers to drive a benefit from IoT. The second one is really this condition-based maintenance. This is preventive maintenance. This is where sensors, where you basically understand the maintenance acoustics of the machines or (other) types of elements of machine behavior that you're trying to track such that you can prevent an outcome of a maintenance failure. And so that, obviously, leads to downtime and slow down the production line.

And so condition monitoring and preventative maintenance is really number two. And the third one is really inventory optimization. This is really knowing where all your materials are on a real-time, basis, linked to your production line, such that you can constantly switch in and out and optimize your overall production. And so we're working in and around with customers, around a wide range of these topics to kind of understand the real big drivers for this.

So as I come close to wrapping up. I mean, we have the right to play. That's the biggest thing we've learned here in the last 4 to five years. I think Marcus said, in talking with and working with technology firms and working with customers -- I mean, they expect us to play a role here. We bring a significant amount of attributes to the table here that are very unique and particularly when you put them in combination with various technology firms, you can bring some very unique solutions to the table to solve some very complex problems.

I can tell you in my lifetime, I've never seen a technology, actually at the price point that you can solve so many problems that the industry has just kind of learned to kind of adopt or they're used old tools and so the efficiencies and the new business models that can be brought here are quite significant.

I mean, we firmly believe that software and technology is fundamentally going to become increasingly enhanced in businesses. We have a customer that's becoming more and more comfortable with it and relying on it and using it to differentiate the marketplace.

And so with all those -- and plus this is going to change the overall risk profile of almost all businesses in the marketplace. So this becomes an area that we really need to pay a lot of attention to.

So lastly, just to kind of have a little fun facts. As I said before, we've been testing, we've been, essentially, experimenting quite extensively, we have over close to 8,000 sensors deployed in the marketplace; 5,900 locations; we have another 13,000 that we're contracted to work on. We have over 58 algorithms that we have basically have developed. We're in the commercial SME market, we're across 16 different occupancies. We have -- we're working with multiple 4.0 partners that -- looking at their topics and their issues.

With our corporate venture fund, we've made 4 investments across the IoT space. And what we do is we partner with these companies, we learn from them, we help them -- weave them into some of our solutions so it's been very important for us in our journey to understand and drive forward on this strategy. We've made one acquisition in this space as well with Meshify. So it's been an exciting journey and hope to have more conversations about this down the road. Thank you.

A - Andrew Rear {BIO 1839965 <GO>}

So Digital Partners. We are a new unit, we're about 18 months old. We're 30 employees, we operate as a single global team out of London, Palo Alto and Cincinnati. I'm sure you understand London, Palo Alto, Cincinnati is, in fact, a great recruiting ground for insurance staff in the U.S. And it's also 50% cheaper than the East Coast and 100% cheaper than the West Coast. So it's a good location for us.

Our team is a mixture of people, some like me who are insurance geeks through and through, others from technology and, in particular, from program management, project management backgrounds. We have a global mandate to write business across all retail and small company lines. So we operate independently. But also we work closely with colleagues from Munich Re who have expertise across a whole bunch of different lines that enables us to operate globally working with partners across multiple different lines of business and yet with a very small team in a local space.

We exist really because of -- we see as the chink in the insurance value chain, which is offering the opportunity for startups. The insurance value chain today is dominated by what I would called the enterprise insurer. So on top of the regulated primary insurance balance sheet, you have all of the customer service, you know tens of thousands of staff, you have all of the policy admin systems, the entire stack and you have almost all of the data involved in the insurance transaction, all inside one roof.

If you started from the future, from a blank sheet of paper and sort of worked backwards in time, I don't think that is the value chain that you would currently design. And you wouldn't -- for 3 main reasons, I think. Firstly, micro-services, APIs, are fundamentally changing the cost of insurance technology. To build a new policy admin system, API-based, is at least 1, probably 2 orders of magnitude cheaper than it is either to transform a legacy system or than it was to build that legacy system in the first place.

Secondly, data. The way the insurance industry has traditionally operated, is of a single one-way transfer of data from customer or broker to the insurer. The insurer says, to become a policy holder, you need to give me the following set of data, you give me the data, I will keep that data and I will use it for my purposes and there's the insurance transaction. Now data exists all around the customer. Firstly, a lot of what we need to know as insurers already exists in the cloud. We don't need to get it from the customer. We can get it from outside so long as we have the technology to be able to do so.

And secondly, there are a very many data sources out there, which are not traditionally used by insurers. We've done an experiment with one of the global digital verticals, think big Silicon Valley companies, I can't name them, looking at whether we could use their nontraditional data to price our traditional insurance product better, combined with the data we already get.

And the results are astonishing. We -- it's only a pilot but our loss ratio appears to be about 10 points below what we would expect, based on this company's data. Now they have an awful lot of data, they are one of the big players. But this just shows that today it's not just about what data you've got, it's also about what data you can access and then what you do with it.

Then thirdly, specifically in the sharing economy, think Uber, Airbnb, Deliveroo. And so on, the sharing economy mixes personal and commercial lines in a way that the industry has never seen. Almost every insurance company in the world today, you walk in there, in their head office and there's a big sign on the wall and it says personal lines to the left and commercial lines to the right.

So if you come in as, let's say an Airbnb host and you say, "I'm looking for some insurance to cover my personal apartment, which I'm renting out. So I'm sort of a hotel. But it's my own personal apartment." Your domestic home insurance will not cover you if you -- even if it's just a normal catastrophic loss, if it's a flood in your home, your domestic home insurance will not pay out, if you have got a paying guest in your home because you've voided your insurance. That's true in most markets that we work in.

But this customer coming into the insurance company is neither personal lines nor commercial lines, they want some kind of hybrid cover. And that actually is very easy to do, it's very easy to design that -- the policy. It's just a combination of the 2 policies. It's very easy to sell, you need some technology to be able to turn it on and off because the way the sharing economy works is that individuals become businesses for short periods of time and then flip backwards. If you're an Uber driver, you're a business while you're carrying a customer and you're not a business when you're just driving home again.

What makes this difficult, is again, the systems. If you've got legacy systems, which separate personal and commercial lines, these products are very, very difficult for you to build.

So for these 3 reasons, we see startups coming into the space and doing what insurers find difficult to do. So they exploit the distribution. And what we're trying to do is simply

partner with these customers, with these disruptors to enable them to enter the space and make a different future for the industry.

So what we do is 4 things. Firstly, we offer multiline capacity. We talk global. In reality, that means Europe and the U.S. Currently we have one experiment going on in Asia. We offer both primary capacity and reinsurance capacity. So sometimes we write products on existing Munich Re fronting carriers, sometimes we write with our reinsurance clients and then reinsure from the back. We do whatever works for any particular partnership.

Second part of our proposition is product design and data. So we have -- we're the experts, underwriters, data analysts, a couple of actuaries and we have an explicit willingness to experiment with our own balance sheet. The reason that this is a proposition for Munich Re, rather than let's a small nimble insurer is because we can use our balance sheet and our global reach to be able to run these experiments without fear of what it might do to our balance sheet.

Thirdly, we offer venture capital. We're a strategic investor. I'll talk a little bit about what that means but most importantly, that means that we partner first and we then think about whether we want to also invest in our partnerships. We don't invest in companies that we're not partnered with.

Then fourthly, technology, policy admin technology. We work with startup policy admin providers and we say to our business partners those who are distributing insurers that they should start at the customer end of the policy admin stack and we will start at the insurance end. The policy admin stack for insurance is relatively long and relatively complicated.

So what we don't do is build apps, web front-ends, anything that touches the customer. We're a wholesale business. Our partners manage customers; we manage the back-end. So we build, firstly, connectivity into our carriers to enable policy issuance. We can then build claims, policy issuance, underwriting. Sometimes our clients, our partners, want to build some or all of that stack themselves. Because our stack is built on APIs, we can connect to our partners at any point completely flexibly because we built greenfield.

Some examples of our partners that I'm going to talk about in a bit more detail further on. Just to give you an example of what, which parts of our proposition apply to, to which partners. So Trov, which is on-demand single item cover, we work with them in multiple countries. So we have just gone live in the U.S. We're working together with them in Japan and we will work with them in some continental European countries. This is built almost entirely on the Trov policy admin platform, which is their core value. We led their last round.

Bought By Many currently is the U.K. We're looking at a couple of overseas markets with them. That's predominantly built on our technology that they built the front-end. But they -- the deep policy admin stack is predominantly ours, we invested but didn't lead their last round.

Drover, which is a car sharing platform, U.K.-based, built entirely on our platform delivered by API. Since we partnered with them, they haven't yet raised a round. So we haven't invested. Slice, which is eventually global, currently live in the U.S. We're working with them on 2 other markets, should be live Q1 next year, hopefully. Built almost entirely on Slice technology rather than Munich Re technology, we invested but didn't lead the last round.

So our partners -- we actually have 10 live. We had one go-live yesterday in the trade credit space. We have got well now 11 startups in build and also 2 established companies. By established companies, think about either global digital verticals or other companies who have a reason to want to sell insurance digitally. So car manufacturers is a good example. It's all entirely digital.

What makes a good partnership for us? Firstly, a large total addressable market. Eventually, we succeed if our partners, who are distributing insurance generate enough volume to be meaningful. So not only do they have to succeed in the market. But the market itself has to be large enough.

The good thing about insurance is that insurance really is a very, very big -- a very big market. One of the questions you read in blogs written by people who don't really understand is, is there going to be an Uber moment in insurance. The answer to that is certainly yes. There will be an Uber moment in insurance, just like there was an Uber moment in global transportation because global transportation is about the same size of an industry as insurance.

If you work in global transportation, for most people, for most people that run companies in global transportation, Uber is not very relevant. If you run a large airline, you've got other problems than Uber. If you happen to work in that corner of global transportation, which is the taxi market, then Uber is the fundamental disruption.

The picture is exactly the same in insurance. There are some parts of insurance, which are going to be fundamentally disrupted from the outside by startups or by digital verticals moving into their space. That doesn't mean there's one single company that's going to take over insurance that -- our market is too big for that. So we look for companies, which are addressing a big enough niche in insurance.

Secondly, like any investor, we're interested in the team. Do they have a credible team? With startups you get a huge variation in the quality of the team we work with. If we look at some of our early partnerships that thankfully we didn't do. But maybe got a little bit closer than we would now, one of the things that we've learned is the quality of the team really makes the difference.

Thirdly, as an insurer, there needs to be a testable proposition, this does put a limit on what we can do. If we're experimenting with our balance sheet, then we have to experiment in those risks where if the experiment doesn't work, we lose operating costs, not large risk payouts.

One example of one I turned down some months ago, was a startup supposedly offering a significantly better risk model for California wildfires. That would have been a mistake in hindsight. Actually one of their examples that they used to show that the current industry underwrites California wildfires badly was of a town, which was separated by a 5-lane highway from the forest that would have a fire. This town burned to ground -- burned to the ground in the California wildfire.

So we avoid things like that, we focus on things where our insurance losses are likely to be relatively small, relatively predictable. So we're thinking about frequency lines so we know whether we got our experiment wrong.

And finally, the partnership has to be sustainable. This is all investment at this point. When we start with a startup partner, their ability to attract volumes initially is very low and, therefore, we need to be in a situation where we are still their partner, as they grow big. And we do that in 2 ways. Firstly, by having big, broad partnerships. So multiple products, hopefully multiple countries. So that our relationship with them is difficult to unplug and replace with one single other provider.

And secondly, we seek to have a technical or technological advantage over potential competitors. At the moment, that's relatively easy because we are greenfield and building greenfield is just much easier. Of course, we expect that competitors will catch up. So what we aim to do is to be in front of them. At the moment, we're focused really just on the front-end on automating underwriting, on automating data gathering around underwriting, eventually we'll also focus on the back-end around, for example, automating claims.

Strategic investment. We invest in so far around about half of our partners. There is no set rule around that. Our investment thesis is primarily that, as a partner, we generate value for our partners. Being capacity is incredibly -- having good quality capacity is incredibly important for an insurance distributor. So having -- by investing in them, we generate value for them. By sort of partnering with them, we generate value for them. By investing in them, we participate in the upside.

The converse also works, by investing in them we accelerate their growth. They use that investment to fund distribution, that distribution writes profitable business for us. So the 2 sides create a synergy. It also creates a broader strategic value. We have a stronger relationship because we are invested and on their board. We have a more strategic partnership. We are potentially an exit for them, at the point that they -- the founders seek to liquidate.

Our investment approach, we always -- we're always talking about minority stakes, we are stage agnostic but we have a sort of sweet spot in the $2 million to $5 million range. We will do seed investments. But in general, we consider seed investments difficult. We're not an incubator, we're not business advisers, we're an insurer and therefore we don't want to get involved in situations where the management team needs support from an angel. That's not our business.

We're active investors. We will either lead or follow. We usually require a board seat or an observer. Currently we have invested USD 35 million, all of those in technology companies with this MGA business model and by MGA really, I mean, they are insurance distributors and they're managing the customer themselves. We're a wholesaler; we don't touch the customer.

So let me quickly take you through 4 of our partners. So Trov, Trov were live before we started in Australia and the U.K. We're bringing them live firstly into the U.S. Trov exists as an app, which you can either download yourself in a sort of B2C model or they also operate in a B2B2C model through retailers and similar partnerships. The idea is that the app uses technology to collect details about your things, including a regular valuation of the things you own and then you very simply can swipe to protect those things. It's a millennial proposition.

If you think about -- if you think about generation rent where they're in rented accommodation so they don't need building insurance. Most renters don't buy -- don't buy contents insurance because the contents of the flat are either owned by the landlord or they're bought cheaply from IKEA and probably won't move with them. So their valuables are things that travel around with them day to day. It's their phones, their laptops, their musical instruments, their sporting equipment and so on. And Trov seeks to cover those items as items rather than cover them as part of a sort of overall renter's package.

So the product, the underwriting, the pricing are all experimental. So the major benefit of us being involved as well as being global is that we are willing to experiment and bide our time to see whether we can make this work. But for us, the particular benefit is learning how to manage on-demand insurance. And also getting involved with Trov themselves and their policy admin platform, which is one of the smartest that we've seen out there.

Slice Labs are focused on the sharing economy initially home share. But that they're moving into ride share, there are B2B2C model, you can buy them B2C. But they're not investing in the channel. There key channel is through insurers and other brands which attract insurance. So one of their first partnerships, which went live just a few weeks ago is with Progressive. So if you call 1 (800) progressive or you go to progressive.com and you're looking for home sharing insurance, you get directed into Slice.

The way Slice's platform works is that you can underwrite your property before the fact once and for all and then you can turn on or of the insurance whenever you have a guest staying in your home. You can turn on or off the insurance, either by calling them or calling them via Progressive or through their website or their app or simply by sending them an automated text message. This product is new. It's a mixture of commercial and personal lines. So it required a new app underwriting thinking. For us, what's really interesting is, this is access to channels that are not otherwise available to us. And having access to lead flow from someone like Progressive for us is very valuable.

Bought By Many is one of our U.K. partners. Bought By Many is basically a social media and Internet search play. They are the sixth most used -- most active websites in the FinTech

world in the U.K. so they have about 5 million hits a year and they are by far the biggest InsurTech in the U.K. What they do is they engage with their customers based on the information they have on their customers. So they interact on Facebook. You connect with them on Facebook. They read automatically your Facebook page, they can determine with a 95% accuracy, something that you're interested in. So if you look at my Facebook page, you'll see endless picture of my dog. They will read from that, their machine will recognize my particular breed of dog and then they will offer me an insurance product tailored for my dog.

Now tailored for my dog -- because my dog is just a cheap mongrel -- really doesn't mean very tailored at all. But if you have a particular kind of French Bulldog, which has a congenital condition, most pet insurers will not cover that particular condition. Bought By Many do; they charge an extra price for doing so. So they're accessing markets that are not well served by the rest of the industry.

Those markets are not well served by the rest of industry because if you have legacy policy admin systems, then to offer a slightly tailored product -- to offer mass customization is difficult and expensive. If you have a modern greenfield policy admin system, it really isn't difficult and it's not expensive. So for us, this is -- this, of course, is experimental but what we get is really interesting insight into customer behavior. Along with engagement with a platform, which has a Net Promoter Score of about 80. They're by far higher than any insurance company I've ever seen in terms of Net Promotor Score. Because what they do is genuinely valued by their customers.

And finally, Drover. Drover is a little bit different, Drover is a platform between Uber drivers and fleet owners. Essentially, they're creating a new asset class. The fleet owners are either at small fleet companies or they are investment groups like hedge funds. So the investment group buys a fleet of Toyota Priuses. Drover manages that fleet and connects them to drivers, 75% of Uber drivers in London, which is their first city, rent their cars. So they basically provide the rental on a daily, weekly or monthly basis.

Before we came along, the way the insurance -- well, firstly why is insurance important for this? It's important for both sides. Clearly, the driver has to have insurance. He has to have commercial taxi insurance. But also the fleet owner, the fleet owner is investing in utilization and resale value of the car. They're not wanting to be exposed to the chance of the car be written off in an accident. So they both need insurance.

Drover provided that insurance and the way it worked in that previous -- with their previous insurer, the previous insurer couldn't accept data by an API. So the Drover platform produced an e-mail with the input information, sent it to the insurer who printed it off, typed into their system, produced a policy document, which they turned into PDF, e-mailed back to Drover, Drover's machine would read the PDF. Around about 1 time in 3, there would be a mistake. So Dover's machine would correct it, send an e-mail back to insurer saying, "Hi. you got it wrong."

The insurer actually -- the customer service staff from the insurer used to apologize to Drover's machine for getting it wrong and say things like, "Well it's always tough

concentrating on a Friday afternoon, isn't it?" They have no idea that they were simply talking to a machine. We do this through an API, it's instant, it's right 100% of the time. On a marginal basis, the cost of each new policy to me is 0.

So finally, what are we aiming to do? Our ambition is to build a global, wholesale digital insurance platform. Wholesale means that we don't and won't touch the customer, except where, for example, a regulator forces us to do so. The customers are managed by our partners and where our partners don't yet have the capability of managing customers, for example, in some claims circumstances, we use an external claims TPA.

That means digital partners cost base is substantially fixed and our margins on a marginal basis are significantly higher than you'd expect from a normal insurance company. So when we get scale, then we produce substantial bottom line contribution. That said, if we get scale.

So our ambition in the next five years is to generate scale. We're aiming to have a round about 40 live partnerships over the next five years. VC investments somewhere around USD 250 million, this is not a budget, it's not even an ambition. I would say, it's just sort of an indication of what our plans look like. An operating investment of EUR 70 million to EUR 100 million and that investment will have built a global multiline platform with frictionless automated underwriting and also at least the beginnings of automated claims and a maintained technology advantage over the industry, as well as their shareholdings and board seats in our partners and, hopefully, an advantaged position for when the InsurTechs begin to mature and look for exits.

A - John Paul Pieper {BIO 2232973 <GO>}

All right, I have the pleasure for having the last slot. The first good message I have -- we've decided not to invest in wildfire insurance California, all right. The nexible punitive play-off ERGO's auto motor insurance in Germany. Couple of words first. I start with the most important number: nexible is a sizably lower investment into a niche market. We consider it a niche market because we're going after the pure online customer.

So really customers, which are absolutely okay, in having in an insurance company that is only offering digital touch across the entire value chain, including claims. EUR 50 million over the next 5 year is the gross investment we're going to make. We do this number because we're limiting my team very consciously to go down, creative routes in solving problems within this model of doing insurance fully digital. What is also important is, that in the end, when we are going to scale, we're going to scale at extremely low expense ratios which are probably unbeatable in the market.

But first of all, what is the actual problem we are looking at? Well we see that there's a customer need, which is rather simple. People want to find an insurance as easy and as possible and as accessible fully online. They want to be very clear and very confident that they're paying the right price for an acceptable coverage. And in the end, they want to have continuous transparency that the service that they're paying for is actually reliable going forward.

What they're going to find however. And I spent my first year now in insurance is something entirely different. They find hundreds of companies offering hundreds of different products, those products are often differentiated, not looking at the customer perspective, more looking at the balance sheet perspective, adding more and more variables to the products itself and in the end that leads to a very, very uncomfortable customer experience that we are trying to challenge as a pure digital plan.

But first of all, why apart from the fact that motor is already a very online (a free) market in insurance, why also have we said that we want to go for motor as the first product. Well first of all, a good thing is that the perceived service quality of customers, of motor insurance players in Germany is extremely low.

So what you don't see on this chart are the number of motor insurance players where customers are perceiving the service quality as very good because they are none. There are couple of them which are perceived as good. But the vast majority is, okay, sufficient or and absolutely inadequate. We're talking here about the entire range of the motor insurance players in Germany.

The second thing is that we looked at the customer personas that we've defined as the pure online customers we're going after and we asked 4,000 of them, quite bluntly, would you actually consider to become customer of a pure online insurance, meaning you don't have access to a call center agent or a face-to-face support across sales, service and claims? And for the 4,000 customers 40% said yes, we will consider that. That was a really good starting point.

There's also strategic rationale why we said we are building an autonomous company entirely on greenfield within a vertical approach building an entire insurance from scratch. And it's a very strategic one, some of you might know the book of, The Innovator's Dilemma. And we have oriented ourselves strictly based on the 5 principles why it can be very smart for a traditional company to build a new one which is autonomous, leading to enter an entirely new market.

The first one is when you are a traditional company, you have some lead customers, which are creating the vast majority of your profits. When you're only listening to these customers, which is a good thing to do, right? You should ask your major customers what to do next as a traditional company. You will most likely miss when there's a new market, a new type of customer turning up because the most profitable ones are likely not to be the ones which are turning up somewhere else starting very small. So you lose sight of new markets appearing as a traditional company.

The second one is attached to that. For really huge organizations, ERGO being one of them, a very small market to begin with, is not really attractive. A market of 50 million size, 20 million size, 100 million size doesn't sound very attractive at first. But we've seen across different industries over the last couple of years, very, very famous examples that a very small market to begin with can explode without anybody really analyzing and predicting it.

The third one, it's also attached to that, which is that disruptive changes within an industry and a market you're operating in, can hardly be analyzed. I come from telecommunications, the iPhone was one of the things that nobody has expect -- has expected be successful. I remember reports years ago, just before the launch of the iPhone, where (all) telecommunications players basically said, technology-wise, the iPhone will fail because the Nokia N73 is technology-wise much better. Well ever have the first iPhone in your hands? It was a really, really good device and it changed the market and I can continue with many other examples. We're looking at that.

The fourth point is that every company is built up of 3 core components. The first one are the processes, the procedures, that you've built sometimes over 10 years, 20 years, decades and you learn to be really successful in a specific market condition, that you're operating in. The second thing are the values that your organization is operating within. These are things, which are not based on a PowerPoint or a wall, these are things that the middle management, especially just knows to be right.

What is the right gross margin to go after? What are the right customers? What product experiments will we do and which we don't? And the third one are basically our resources. It's money. And it's the type of people, the know-how, the experts that you have.

The only thing that is really exchangeable when you create a new company, whatever, are resources. Procedures and also values you cannot transport when a market conditions you are operating within are changing. And the last thing is that especially big players often confuse new technologies, somehow as customer demand. That said, very often there is no customer demand even there is -- there might be new technology appearing in market. And in such a condition, it might be very smart to create a spin-off, which is considerably small because it doesn't have the 5 limiting factors of The Innovator's Dilemma.

The first one is we're a small company, 20 people are working at nexible, that's not going change for a while and for us, every market regardless of the size is considered a really good opportunity. We're going after that with full force. We don't have any lead customer that already exists in our portfolio that could confuse us in any way. And we appreciate that opportunity. We are not believing in just analyzing the future based on historical data because we hardly have any. We have to build ourselves up to speedily build, measure and learn to find the sweet spots to be successful in a pure digital insurance model.

We create our new procedures and all our own new values to be successful for those very customer types we're going after and we need to be flexible and to -- in order to adjust based on their needs. But we have the advantages of spin-off to use the resources of Munich Re and ERGO in order to speed up our development in our market.

And the last thing is we can focus solely of the customer types that we are focusing on. We are not getting deviated here. And we can build something that they hopefully value, love in order to stay with us.

What that basically means comes down to a value proposition that we have created from the start. First of all, we are very, very proud. And we think it's very practical to be a spin-off within Munich Re and ERGO. In fact, that has already been shown over the last couple of months. But it also means that we are in the end part of huge insurance players, which means a lot of reliability and predictability to the customers which are hopefully deciding to go with us. It also means that we have the resources to expand very rapidly into other products, into other countries and showing that we, in fact, have built a, technology-wise, very scalable solution that can enter different markets in Europe.

From a customer perspective, no paper, no phone queues and cancelability every month are the basic things that we build our proposition on, not trying to tie our customers to us. Following here, the best examples of digital player like Netflix and so on and so forth.

We are aiming to build really competitive price points for all products for the selected customer segments that we want to be successful in. And in combination with our low cost, we can afford that. And also the fact that we are only focusing on digital channels is, for us, not a restriction because the customers we are trying to attract, for them, it's actually more an argument to go with nexible, not being annoyed by talking to a call center agent every time and every time again.

And the last thing is around the proposition. From an insurance perspective, you can get a very, very quick insurance within our process. We only are asking a couple of questions because we build our risk and tariff model entirely up from scratch, building on top of what we wanted to achieve for our customers, which is speed and ease -- simplicity. The second thing is we are focusing pretty much on our claims process, making sure that in that process, we can offer a first repair cost estimate. And therefore, a settlement offering to our customers within a couple of hours and that we can give our customers the transparency and flexibility of their coverage in order for them to change it whenever they want it to.

This is how it looks like at the moment. It looked quite different a couple of months ago because our initial beta launch, we already did July 4. Remember, I joined in October 2016 at ERGO. The teams has been formed between February and March. In July, we already had our ready-for-sales launch as a better within ERGO with 6,000 friendly users. Based on the feedback of the users, we entirely changed our proposition again. And we launched in time and budget on the 16th of October. So we are live since a couple of weeks, which I'm really happy about.

You see a couple of impressions, which are also showing the thing that is really important for us. It's showing a frictionless and seamless and very easy user expense. And we are working our way towards the customer feedback. We are getting closer and closer to being a UX leader in the space that we are targeting.

Strategically, 2 things have to be differentiated. And we're using that as kind of our playbook in the last couple of months. For us, there are 2 things which are important. So first thing is called the duty. We want to build a purely digital insurance organization. And what that means is not being in any way confused by generating customer points, being

too crazy about reinventing insurance without having proof that customers actually want that.

In fact, our customer testings have shown that there seems to be a sweet spot of what people know about insurance. And when you deviate too much from the sweet spot, people lose interest because it's a lower-relevance proposition. And we shouldn't trick ourselves. So what we've focused on, first, was building a truly operating, working, technology-centric, pure digital insurance company. No sweet spots left and right, no light bulbs or whatever, just doing that and doing it really well.

Next to that, we're running a variety of experiments to finding out what are meaningful ways to make out of a purely insurance organization something a bit more than customers think it is.

There are 4 core principles. And if I have one wish, I would love if you could remember those 4 after your leaving today. The first thing is we want to keep things simple. Two examples for that is we decided to basically take all the complexity of motor insurance away that has been built up over the last couple of years. And we decided only to go into the market with a single tariff; nothing else. The only differentiation we have to make is Kasko (sic) (Comprehensive), Teilkasko (sic) (Partial Coverage) and covered Haftpflicht (sic) (Liability).

No packages like (SNL). No unnecessary confusion because we found out that our customers, they don't want to make a decision that they cannot really decide. So you don't know how these different tariffs are really differentiated by each other. And it's also the reason keeping it simple while we wanted not to contract them for too long. We give them the opportunity to leave us in every month that they are staying with us.

The second thing is do it online, which means pure online touch points, may it be wire chat, which is going already extremely well in our world; maybe via e-mail contact forms, chat bots and going forward, Facebook, Messenger and also WhatsApp. Everything we do will be entirely online. And we are not going to make any compromises in that space. We'd rather become creative if it leads to challenges from an operations perspective.

The third thing is -- sorry, one thing, risk factors adjustable at any time, that, I forgot. It's a really important that, when customers have probably built into their quoting process, information that was not entirely correct, we want to give them the ability to reprice themselves at any time they want. Also important for the busy season in Germany, every 6 or 7-- so every time in November and December, as you know, there is the big change season where people are changing their car insurer. And in that space, we want to actually campaign to give people the opportunity to recheck whether they are still properly priced and notably insured with nexible.

Design to cost is a really important principle because one thing that my entire team has come up with and really loves is to say, "We're offering a service that ideally a customer never has to use." Never has to call us up on it. And if you sell such a service, efficiency is nothing optional. It's a question of respect in front of your customers.

So design to cost for us means that our costs are fixed, right? We're not going to scale them up, right? We started with these 20 people and, for motor insurance in Germany, this is what we say. And if it is limiting us in any way to further increase our success, we're going to deal with it in a creative way rather than adding costs.

That also means and comes down to having more standards than exceptions. So every time we come to a decision point, a crossroad, well, we'd say, well, actually, for 2% more sales, we have to make an exception than it's extremely likely to we say, "No. We're not going to do it", because it is against our principle of designing to cost. But it also means continuous automation in everything we do, which was the key decision where we decided to build an entirely new customer management and also claims management system and not relying on existing technology, which will also limit us to test out what we can actually do from an algorithm, from robotics, from automation and from machine learning standpoint. It's all coming down to experiments.

Last but not least, we are going to communicate under the ERGO brand and we are also not communicating under the Munich Re brand. In fact, we are building a new insurance brand, which comes with a lot of challenges. In order to overcome those challenges, we need to be free enough to basically communicate in an edgy way, finding out how to basically get our customers to recognize us all the time and building up a brand that people hopefully trust and like.

I said that we are building our own technology. In fact, that's what we do. The reason why we are doing it is basically twofold. The first thing is we looked at all the existing technologies available in the marketplace that you can buy. And basically, what we saw is that all these software platforms are built in principle for big organizations. They are not built for the CEO of a big insurance company or an operations management system or claims management system or a policy management system. It's built for the director who is in charge of that function. Every director in every of the 400 insurance companies in Germany has a couple of hundred people under his or her responsibility.

For these people, the software out there in the market is built, which is why we have decided it cannot be done; it cannot work for us. We have to go further, find a good technology partner and start from scratch, which is what we've done. We started basically with 0. And now we are live. And we're continuously improving in an agile delivery and deployment model our platform in order to meet our needs. The platform is also from an IP perspective ours. So we can do with it whatever we want, whether we want to in-source at some point or not, further improve it, it's entirely up to us.

It is entirely IPA; (sic) (API)-centric platform. This is standard. It's a modular architecture. That's standard as well. When you build something from a technology perspective new, it has to tick these boxes. But what is most important is it is extremely efficient to build up, it's entirely scalable. And it's already built for having in mind that we want to enter the next European market already in 2018.

One example for what it means to be simple. So before we actually launched, we had, as I said, a beta version of our product, which is entirely built around a different principle. It

was built around configuration ability for our customers. We tried that because we thought it could be a really good sweet spot for (the very) technology, (I think), customers, which are the ones we thought we are going after. But what we've seen is the pure digital customer actually doesn't want to make decisions. So what we were doing, we looked at our risk and tariff model and we said, "What is the best possible tariff that we can calculate? And how can we make sure that this tariff is basically addressing 85%, 90% of the needs of every typical customer we're going to face. And we're going to attract?

Then we took this product. We priced it. We priced it entirely risk-adequate. So no material optimization on a tariff level in order to create further profit boost. We just said, "This is a risk-adequate price. We allow cost. And this is the sale price that we are taking that product to market." And in fact, this is how we started. And we're keeping our principle of keeping things simple. And we're going to do that with the entirely new products that we are going to build in exactly the same fashion following that principle, too.

From a sales perspective, we are not denying the current reality of the sales environment in Germany. (18%) of their policies sold in motor insurance every year are going by the price aggregators. So we decided that being on those aggregators for a start is not only a sales investment to us; it is a brand investment. In fact, when you go on nexible.de, our website, you can even find VERIVOX and CHECK24 as a brand on this website because what we found out is that our customers, they say, well, when you're an unknown insurance brand but you are on the price aggregators, in fact, you cannot be that bad of a company. So we used that as part of our branding strategy and played that very, very obviously and very, very directly to our customers that we are there. From the start, we started with Google. But it's only 20% of our activities because we also know that search and bidding on certain keywords is also a market that is really, really difficult to get into. So 80% of our sales experiments are running on Facebook.

An example is we are working with a backend integrated Facebook advertising company that is playing our thousand and thousands of user individual adverts on Facebook in every single day of the last couple of weeks. So they are looking at the target customers that we want to target and they find out, quite similar to what Bought By Many does, what kind of apps could be very attractive for them in order to get their attention, showing them specific cars, showing them specific faces, showing them a person that looks roughly like their age and so on and so forth. And we are trying get traction in that sense.

There are, at the moment, 4 very focused examples of sales experiments. We are running because, of course, we want to differentiate and disconnect over time from the price aggregators, right? But for a kick-start, it was a good decision for us to make.

In the end, what becomes really a proof point in next year is going through our first claims and also making sure that our customers are going to stay with us. So we are already now forcing on building analytical models for a cancellation point of view to making sure we can be in front of the curve and making sure to find out how to make our customers have continuously more positive experiences on an emotional level and on a practical level going through our processes and procedures going forward.

As I said, we started with motor and we're starting with a very focused sales approach on the aggregators moving into the more direct selling space over time. But what was always clear to us is, motor is only the first product, the next product is going to come. And what also was clear is scalability is a very, very important thing for us.

Our key strategic element was to making sure that we find out how to quickly expand via freedom of service within the European Union without changing massively technology we have already built. And this is the process we're in now. From a product perspective, we already know that we are going to launch a motorbike insurance in April. We already built that, it's just not the right time to launch it in winter. So we are looking forward to that. And the pilot is going to come in Q1 2018 to look after travel insurance.

The reason for that is that in principle, we think that because we are only operating entirely online, we need to think more in propositions. And the mobility proposition, motor plus travel, in fact, could be an understandable cross-sell for the customers we are going to target.

As I said, we are a very proud part of 2 big insurance groups. And in fact, we are using that quite intensively with regards to -- well, in a very selfish way on one side. But also in a way to give things back to both of these organizations. These are just a couple of examples of the things that we already received from them, made support in HR, made support in data science or artificial intelligence services, joining up being quick in trying and experimenting with new technology because, in fact, we can do that much faster than any other company in the group. Joint real-time advertising. So in fact, when a customer is not going to become an ERGO Direkt customer on their website, for ERGO, then we are going to target them with nexible and try to get them probably via the nexible brand.

On the Munich Re side, apart from artificial intelligence and so on and so forth, we use a lot of the consultancy services within Munich Re to actually build up nexible. So the motor insurance consultancy group was very helpful to actually do that. And there could be -- I could give you a variety of other examples, which we already enjoyed as synergies of being part of the wider group.

But on the other hand, we are also giving something back because we are a very transparent operation and we are connected to the important people in the organization order to nearly in real-time transport back the learnings of the things that we've done of the capabilities we've built already. Our risk model is a good example, it's currently under investigation in ERGO Germany, making sure that everything that nexible has already done can be immediately reused if it makes sense in the wider group.

From a differentiation point of view, we are basically categorizing the 5 competitors we have into 5 groups. There is a classic insurer. Basically very exclusive sales force, heavy broker sales, heavy, et cetera. Low cost direct insurers, which are basically focusing on not changing the way insurance works from a procedure or a technology point of view but managing that in a very efficient way.

Then, there are comfort digital insurers, which basically became huge in the omni-channel space. So using all different types of contact points, making sure to get the customer in whatever way he or she is preferring to. The pure online but not really digital ones, which are basically websites with big call centers in the background and price point, which is very often driven by very huge marketing costs.

And in the end, some new attackers, which are almost pure digital. But none of them so far has actually dared to be purely digital. There are always compromises. A hotline for service here, hotline for claims there. All things which are eventually driving costs up and are compromising the expense ratio. And we know that against all of them, we have certain advantages, which we are focusing on, going to expand over the next couple of months and years in order to not lose our differentiated position.

But in the end, Andy is right, it's all about the team. And the team that we've created is basically half of people of outside of the insurance industry, especially in the areas. And you can see that quite clearly. Well we believe that insurance is not market-leading, marketing being one of them. So we brought very great experts in our most important disciplines, performance marketing, social media and performance marketing and also digital branding into our remit in order to have the right expertise on board here.

Also in technology, we do believe that insurance are not a technology player so far. Not from what I -- we have seen. So we brought the people into our team to driving that and transforming all the people we got from ERGO, really great experts in their fields, to be a combination of insurance and technology experts because in the end, if you want to build an entirely digital insurance company, technology is not something you can also focus on, it is the entire center of your operations. So it's an -- in the end, it's the heart of your operations. So every single one of these people here, regardless of the background, has already learned within the couple last months that we went through to the launch how to actually develop software for the benefit of the function they are responsible for.

And to wrap up, there are 7 things which I truly believe we have to focus on to make nexible a long term success. The first thing is we need to trust that we can develop a brand and we have to really create it and fill it with life. Because at the moment, it's still a really new company and it needs to start standing for what we want it to stand for.

The second thing is we need to stick to our beliefs and not make any compromises. But we shouldn't equally shy away from massive strategic pivots if we see that our experiment is going into the wrong direction. I briefly said that in July, as we launched our beta, we had an entirely different product and then we had three months to actually change it by 180-degree. We didn't shy away from that and we were successful in doing that even though it was at risk, it was a big strategic pivot and we have to be prepared to do more of them, being very quick in the things we do.

The third thing is that pure digital means pure digital. No compromises in that space because as soon as we make compromises, we are also going to compromise with the principle of design to cost.

The fourth thing is about unleashing the power of 2 giants without being absorbed by 2 giants. nexible is entirely autonomous in every aspect of the insurance value chain. We need to be sure to keep it that way, otherwise, we are not going to be successful. But equally, we need to become, as a team, smarter and smarter in utilizing the resources at our disposal to support our journey on becoming a super successful purely digital operation.

The fifth thing is about balancing and leveraging corporate resources or well, it's actually kind of connected to that, I just see. Well anyway, you know what I mean. Making sure that you are autonomous but you can still get the resources in place that you need in order to be successful.

Sixth thing is about speed beats perfectionism. So building an entirely new insurance within a couple of months was quite challenging. And I remember the last time we made a shot to say, do we really want to launch now, was on the 15th of October, on a Sunday. We brought all the important executives together to make a decision together and in the end, we were not quite sure. But in the end, we said, "We need to start now and start good entering the learning curve instead of postponing of a week or whatever." Retrospectively, we were absolutely right in doing that. Speed is more important than perfectionism when you are able to cope with changes and you are able to adapt very quickly.

And the last thing is about developing and learning cannot be a silo. Everything we do, as I said, is basically in the hand of a single person in my team that is solely responsible. And here is the person, transformation back into ERGO. Making sure that this person knows everything about what was going on in nexible without compromising the time and the resource of my own team and leading back into the ERGO organization in order to benefit from learnings that might be beneficial for ERGO as a group.

And that is basically nexible. Thank you. So much.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Thank you very much, colleagues. Last round of Q&A, William, please.

+++qanda

Q - William Hawkins {BIO 1822411 <GO>}

First of all just for Greg, when you were talking about HSB, can you talk a bit about the challenges that you see working with the new data you're going to get from all of the sensors. Because on the one hand, it's an obvious opportunity. But when you talk, even to other people in Munich Re, there are issues of you getting whole a load of new data, it's a new scale, the data may be telling you sort of new things and so you have to go through a learning process yourselves to understand the data and potentially, there's a challenge in terms of your relationship with your customer in terms of anti-selection because they also know the sensor data and the rest of it. So given that you are sort of largely starting from square one again in interpreting this data, there can be sort of a challenge there. So I

wonder if you could just talk a bit about that? Then secondly, John Paul, a lot of what you presented, I was kind of thinking about nexible should really be part of Digital Partners portfolio, not part of ERGO. Now it may be the answer to that is what you're saying in terms of the knowledge transfer and the rest of it but I just sort of wondered if you could comment on that. And I suppose, to the extent it may just be history and strategic relationships and that's fair enough, the bigger question is, are there any issues where ERGO influences what Digital Partners can or can't look at because, again, maybe that's more for you, Andy. But maybe if ERGO is thinking about doing certain things and you're investing, do you guys ever, in practice, have any issues where you have to kind of draw the line between the 2? Welcome aboard John Paul. We're looking forward to your money, buddy.

A - Greg M. Barats {BIO 17365510 <GO>}

Okay, I'll start, a. And hopefully I capture your question. So the challenges that we kind of came up against in the IoT space. Quite a few of them, actually. I think, if I give you a fast-forward of 4.5 years. And said, which one of the biggest lessons learned about IoT is that IoT is not simple. It is definitely not, it's very complex. So being an engineering mindset and a lot of technology folks in on our team, similar to the -- to my 2 colleagues here, 60% of our team are people who are outside of our HSB team, there are people (for the) software engineers and other technologists from other startups and technologies as well. So we have that. But really, it's experimentation. I mean, we really dived into taking, actually, the technology apart and really understanding. And putting in action in a real environment, cold, wet, down in basements, next to other pieces of machinery that are actually working in terms of vibration and heat. And every one of them understanding what their strengths and weaknesses are and we're at a point right now is, in many cases, we're actually building our own hardware right now. But we're finding in the open market -- for the conditions of the markets that we're actually trying to test for, we're not finding retrofitted sensors that actually fit our needs. So we've really advanced quite far. We don't want to be a manufacturer of hardware but we found that we had to design it in a way that kind of meet our needs. So the challenge has been endless. Some of them have actually -- very simple things that you would think that, you'd say, "Okay, well that -- that's a -- that should be a no-brainer. If you take the car alarms, think about when car alarms first came out and everyone put them in, when the first one went off, everyone ran outside to look at what's going on. Six months later, no one got out of their seat because you realize that these alarms went off for a wide range of different reasons and most of them had nothing to do what the cause was. And so where the really intelligence comes in. And this is 1 simple little thing over 100 different things you have to figure out, is that every occupancy and the exposure that you're trying to understand has a certain behavior. And so you have to understand, you have to download the data and you really have to understand the kind of behavior of the business such that you send an alarm when it's actually very meaningful and it's not when something happened. Now I'll give something, very, very simple to make it -- to get the point. Think about refrigeration. Perishable goods is a big loss that a lot of different businesses have. It could be food, could be flowers for a wedding or it could be medical samples. And so the cost and exposure is quite different. If you just put a sensor in there and you look for temperature variation, people go they open the door, close the door all day. And actually, some people go and open up the door and they prop it open while they load things in. And so you actually have to understand the behavior of the business such that when you see a variation in temperature. And you relate it to some other element, could be motor, could be some

element that you're getting from the motor, you'll realize that it's actually a real vent and it needs a real -- you need to send a real signal. And so you have to understand kind of the behavior so when you do send a message to somebody they know how to react. And so that's just a small little challenge. So we, like I said, four years at this, we've really unraveled a lot of the problems and a lot of the topics here. So -- but it's purely by testing and interfacing with customers and taking it apart. It's really just rolling up your sleeves.

A - Andrew Rear {BIO 1839965 <GO>}

Maybe I can address that Digital Partners versus nexible question. I mean, first of all, nexible is a part of ERGO and benefits from ERGO's presence in this particular market, in this particular country. Had that not been the case, if nexible was an independent external startup and they'd come to Munich Re saying, "We've got a business idea." Then, yes, probably it would have been a digital partner's thing. It's certainly the kind of proposition that we would have supported. And had they not had the benefit of ERGO's insurance balance sheet and ERGO's insurance expertise, we would have said to them, "Great, focus on being an MGA, build your digital proposition and we will support you as a wholesaler." If at some point nexible goes outside ERGO's footprint, if they decide to launch a pure digital motor insurer in the U.S., for example, then maybe we could become their partner because we have wholesale insurance capabilities in that market. In terms of conflicts between them, I think Digital Partners and nexible are both very fortunate to have parent companies that understand that we will cause conflict. We will cause conflict with the activities of our parent and in the reinsurance case, the activities of our parent's clients. That's inevitable and we accept that. We talk, we share ideas. I'm hoping that John Paul will make a lot of progress on claims automation, for example, which I can then use some of that technology. But if we end up competing in certain markets, then we end up competing, that's all part of the game.

A - John Paul Pieper {BIO 2232973 <GO>}

I would agree, I think 2 things from an objective standpoint might be important. The first and most important mission of nexible is to push the boundaries, to push the limits of doing insurance fully digitally. The reason why it is important also for ERGO is because everything we learn along the way can be very practically used within the ERGO operation as a whole. And the second objective is to basically target the niche market and make it actively bigger, which is also something that can be done much easier when you have the support of a primary insurer like ERGO at your side because it will not always be as easy as it might sound.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Thank you. Kamran?

Q - Kamran Hossain {BIO 17666412 <GO>}

Two questions, both for Andy. First one is, what's the one biggest challenge that you face working with startups? Is it speed of doing things, culture, IT, security? And the second question is, I guess, apart from nexible, what's the one thing you wish you had invested in? So if you look kind of what else is out there in the industry at the moment.

A - Andrew Rear {BIO 1839965 <GO>}

The biggest challenge for us, yes, is primarily speed. Startups have -- we like that they're aggressive and they move quickly. But the reality is insurance is complicated. It's highly regulated. That's particularly so in the U.S. In the U.S., it's almost impossible to launch a new proposition from scratch in less than six months. And six months sounds like a lifetime to most startups. So what we've done there is over time, we've become very focused on agile delivery. Many of my team came from an agile background but we've had to relearn what agile really means. And one of the things that we do is that we find the shortest path to a feasible and compliant implementation. But we are very clear upfront with the startup at what the backlog is, what needs to be done before they can hit launch so they can see the scale of what they are -- what they're getting into. In terms of what things I've missed. We've been in the fortunate position so far of being really the best game in town. So we have seen everything. There is nothing that I've seen gone to somebody else that we've been very disappointed about. One area that I think is very, very interesting is the workers' comp space. We see a bunch of different propositions around that. So one, for example, a piece of hardware. It's about the size of a packet of cigarettes worn on the belt of logistic workers. Think DHL, they actually did a pilot with DHL. It was not a very sophisticated sensor compared to some of the things that Greg uses. It basically had 3 functions. It measured the way the individual bent to pick up object and it fed that back and sort of analyzed whether they were bending or whether that was causing -- likely to cause back problems. It had a proximity sensor so that if there was a -- let's say, a forklift truck driver. And so the sensor that was worn by the driver could see itself going quickly towards the sensor worn by somebody else who was stationery or walking, it would warn the driver and they haven't yet connected to the forklift truck to cause the truck to shutdown but that's clearly relatively simple to do. And thirdly, it had some simple geolocation, stopping the individual wearing it going to areas where they would be in danger, for example, automated loading bays and so on. Those 3 things together in the pilot reduce risk by 70%. Now this was just an early stage pilot. It was just 1 company. The problem for us as Digital Partners is that this is U.S. workers' comp and if you want to get into U.S. workers' comp, you have to do a lot of more than think about the interesting digital experiments and what else you could do that there's a whole problem of actually workers' comp as a line of business. So so far, that's an area that we have completely avoided just because we think the insurance element is just a bit too difficult.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

There was a question from Vinit.

Q - Vinit Malhotra {BIO 16184491 <GO>}

Thanks, John, for sharing transparently that you had to beat up roll-out time, you had to completely revamp it. I mean -- and you're still persisting with speed as very critical. Are you happy to share -- I mean, how bad was that first stab at it and how was -- I mean, because -- sorry, how bad was the first experiment? And obviously, you're still sort of -- you have launched sooner than probably some people who are agreeing with or anyways. So if you're just happy to share, it will be great.

A - John Paul Pieper {BIO 2232973 <GO>}

Yes, sure. I can happily do that. But first of all, it was probably the best experiment because we decided to not launch. We decided to use our position within ERGO to get a first feedback on the first part of the proposition we've built, all right? So it was a ready for sale insurance basically. And we built it to basically say, we give entirely the control of all aspects of the coverage in a very easy way into the hand of a customer, all right? And what we saw was that a typical motor insurance -- and you remember probably the slide with a lot of boxes, all right, consist of around 18 to 20 factors. So things like: Do you want your car key to be insured for EUR 500? EUR 1,000? Or EUR 3,000? And basically, the consistent feedback was, great, that I have so much control but I don't care to make decisions about things, which no typical consumer can actually make a decision about because they don't know. And that was, for us, probably the most beneficial thing to say, all right, when the translation of that need is that consumers think that basically insurers do a lot of business with creating additional complexity where there doesn't need to be one, then we have to do the opposite. It was probably the best experiment that you could do and the upcoming months showed us that we can do it entirely differently in an even shorter time frame. So it was a really good one.

Q - Vinit Malhotra {BIO 16184491 <GO>}

Sorry, Andy, can I ask you one thing? You mentioned a few times that you don't want to be involved with customers for cost reasons. But clearly, with your experience and expertise, isn't that what you should be also thinking about, getting involved with and helping them grow or how do you think about it? Or did I misunderstand that you don't like their customers...

A - Andrew Rear {BIO 1839965 <GO>}

So we're deliberately a wholesale business. That is why Digital Partners sits in Munich Re rather than in ERGO. So you can think of us as, if you like, a digital version of the traditional MGA business model where in the MGA business model, the MGA looks after the customer all the way through their life cycle and the carrier then only touches the customer to the extent that they're forced to for regulatory reasons. That is very much our model. If I build a customer management front end, then there's no way I can be multicountry, multiline, then I've become a business more like John Paul's, which is more about how you manage the customer.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Please, Nadine?

Q - Nadine Adrienne Marion van der Meulen {BIO 15200446 <GO>}

I was wondering if you could comment on the usefulness and just your views on blockchain technology and whether you're investing in that?

A - John Paul Pieper {BIO 2232973 <GO>}

So I can -- is it for me or for all of us? I can start. So actually, we are considering a use case but the thing is when you look at blockchain and you really want to get, well, immediate value out of it in a business model like mine, it comes down to things like making sure that a piece of information has integrity, all right. So something like that you can do. For that,

we are actually considering to use it. But the business impact of something like that comes down to a really cheap public relations article, all right. And that's it because it's actually, from a technology perspective for a team like mine, rather trivial. Where you can think about it further is actually totally democratizing the entire insurance process. We are not thinking about that at the moment because we don't think it's a commercial model at the moment for us. That's my take on that.

A - Andrew Rear {BIO 1839965 <GO>}

So for me, I admit I've become slightly obsessed with gambling on crypto currencies. But it from my business side, I don't see a use case yet.

A - Greg M. Barats {BIO 17365510 <GO>}

Yes. In IoT, we're looking at it. There are also a lot of complex, you'll say, transactions of data within a manufacturing facility that we're looking at some scenarios there but right now, we have a lot of other things that we're looking at. So -- but that's on the list.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Thank you. Time for our last question, maybe? Roland?

Q - Roland PfÃ¤nder

Coming back to nexible, it looks to me it's a very technology driven solution approach. But isn't it normally the customer the first one, shouldn't you look more for customer demand than wishes?

A - John Paul Pieper {BIO 2232973 <GO>}

So in the end, we have already processed around 400 customer feedbacks during the entire process of building up nexible, all right? So yes, I agree with you and that's exactly what we do. But in order to be able to actually use those feedbacks in a very agile and fast fashion, to do something with it, you need to be a technology focused organization, all right? When you think technology is something you can leave to an IT company in order to comply with the wishes of your customers quickly, then I think you're wrong. And that's exactly why we say customers are interested in technology excellence and therefore, speed.

A - Christian Becker-Hussong {BIO 19080254 <GO>}

Good last words, speed. Thank you very much, colleagues. Thank you. Thanks to all of you for coming to Munich for being interested in our story. We certainly found the day very interesting and we would just like to ask you for feedback because it would be very important for us in order to further improve. And I wish you safe travels. And with that, I give it back for a last remark to Joachim.

A - Joachim Wenning {BIO 16273429 <GO>}

Thank you, Christian. Thanks to you for your attention. I think, it found a lot of interest looking to your faces. I followed the Q&A and in the afternoon, frankly, I had my headset

on while I was doing some paperwork and that was interesting to follow. I hope that what we promised that you get a real view into the workshops, into the activities, into what is going on here has helped you getting a better understanding. I hope that why I'm saying, I am confident, looking forward, I am confident that this group has the power and has the passion, even obsession, I heard, the obsession to build new businesses. And seeing how much technology is built into it, how much data is built into it, that it goes really way beyond what we have been doing in traditional, I hope then you share this view, why I have that confidence.

Thanks again, for your interest. I hope you have a safe travel back. And looking forward to see you next time on the next opportunity. Bye-bye.