



**Transcript of
MTN Group
Capital Markets Day
Session 4 – Artificial Intelligence
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Nastassia Arendse

Welcome back, ladies and gentlemen. Now it's time to turn our attention to one of the most transformative technologies shaping business and society, and that is artificial intelligence. Across industries, AI is redefining customer experiences, operational efficiency, and new business models. For MTN though, the question is not whether AI will transform the business, but how quickly and effectively that transformation can be harnessed to create value. To explore that topic, I'd like to welcome to the stage Group Chief Technology and Information Officer Charles Molapisi. At the end of his presentation, we'll get into a short fireside discussion that will involve the CEO of MTN Group Digital Infrastructure, and that is Mazen.

Charles Molapisi

Good afternoon. Thank you. My colleagues have touched a lot on AI today. It is my intention that in the next few minutes, I'll stitch the story together, provide a little bit more colour on how we intend to play. My ask is that when I do this presentation, that you look at this with an upside/downside asymmetry lens. And I'll explain that in detail as I go into the presentation.

I also want to say, ladies and gentlemen, that one of the critical success factors of this technology, it is well documented, that you need a solid level of buy-in from your CEO. And I'm hoping that in Ralph's presentation and all his articulation that you're getting a sense of his ambition and expectation about this technology for MTN and for Africa at large.

How are we framing it? We have seen this slide before. We are placing artificial intelligence across all segments of our business. We expect that we'll implement this in the Connectivity space, in the Fintech, and of course, you heard what Mazen captured around Digital Infrastructure. So, I'll spend a little bit more time giving you a bit more colour in terms of how we organise and where we see the value unlock for this technology.

The arrangement goes like this. So, we are seeing three pillars for AI at MTN. We believe that we have an opportunity to play very solidly around **AI Inside** the organisation. That could translate into a number of initiatives. We're talking about AI-native networks and operations. You can talk about agentic capabilities on the network, autonomous networks, AI in finance, AI in technology, AI in RA or legal. And I'll double click on how we see this tower, the expectation in terms of delivery.

On the **B2C** side, the colleagues spoke a lot around hyper-personalisation. How are we taking our products to market? How are we segmenting our customer base? How we make sure that we are able to target customers in a micro way. And I'll cover some of the use cases. Another part of B2C



is going to be how we commercialise and bring and white label new products, AI-centric use cases to the market. So, see the B2C pillar in two layers: hyper-personalisation, GTM capabilities, part of it we're already doing as we speak, but we're going to deepen it. But we also have ambitions in terms of creating new services that can actually use the plumbing that has been created in terms of new product and services.

Then there's a **B2B** part. This is largely an enterprise play. Think about GPUs as a service. There's a lot of expectation around inference. And I think it's very clear that the future largely, if you think about a data centre, you must think about a data centre as a continuum. Essentially, you must think about central data centres, regional, and then inference. Because it's very clear, if you look at a trend of this tech, that a lot of work and capacity and services are going to be consumed at the edge nodes.

So, we're positioning ourselves to play in terms of AI-RAN, which was also captured yesterday. So, you can think about the AI-RAN and say, we have a whole inventory of physical assets, which is the base bands that you see on the towers. Those base bands today, the capacity and the power utilisation on that is only to service the radio network. What we are seeing is that we are going to expand the utilisation of that infrastructure, in a way re-price the profile of the infrastructure by enabling it to provide more capability than just a RAN, maybe give a bit more services that we can deploy on the network.

AI Inside, AI B2C, and AI B2B. How do we know if we're successful? We have to see a revenue uplift. We have to see a margin uplift. And then there must be some form of a capex optimisation, which I'll touch on it. And then, of course, customer experience uplift. There are certain things that we have to be sure about. All of us know about the sprawling of agents on the network. We have to contain that. We have to manage that. We have to make sure that we deploy AI that is safe, that is well governed, that is ethical. And of course, all of us know the pre and post-Mythos world. So, it's important that as we deploy this, we are very practical about the security implications of this technology and how we're going to govern it.

So, another way to look at this, again, we see like I said, this has three pillars. So, let me say again, margin lever, that's what you must expect in terms of **AI Inside**. Essentially, what we're going after here is opex optimisation using AI as a margin lever, and we're pushing aggressively for capex optimisation, so avoidance in this case. And in a sense, we expect that there must be some form of a margin expansion.



If we think about it, we think that this tower, this pillar, largely should be self-funded. And I think it's got a high certainty of execution. So, it is the primary pillar that you must execute with speed. Like I said, if you think about upside/downside asymmetry, you must see this as a portfolio. Essentially, you must be able to expect that where is the management more certain about their bets? And how are they managing that. What doesn't work is still manageable. So, that balance of the lens is what I spoke about.

B2C, we are excited about it, again, measured and very practical in terms of the expected revenue uplift. And if you think about it, then you say, Charles, what could be the challenges around the B2C implementation? I'll say to you that it is gated by adoption, meaning that the rate of adoption and expectation from customers, and it's also an issue of token economics. How much will you be able to profile these solutions? At what cost base are you going to do? What is the engagement in terms of the partners or the customers? How much are they prepared to pay? Whatever savings that you are putting forward.

Take it to the far right, the revenue lever. This essentially is just the selling of compute. We expect that you are selling capacity at a particular price. The big metric here, and we have seen that in the presentation that Mazen covered, is going to be token per watt when it comes to the economics. So, the mathematics is basically the ones who are able to produce tokens at the most economical rate wins the game. It's not about who's got the best compute and the best models. It's about energy implication in terms of token generation.

So, if you were to say, what is management hurdling? What is the hurdle that management is negotiating on this pillar? You have to think about energy. You have to think about capital. You have to think about incurring the demand, expectation of how quickly you can roll out and the take-up rate. Then you have to think about token economics. So, I'm giving you this so that you understand the extent of the profile of the portfolio, that the portfolio is not uniform. And it must be managed and attacked and measured differently across all the pillars.

This slide is a bit of a busy chart, but I'm headlining this chart: the **AI Inside imperative**. I'm hoping you will leave here with a very clear understanding that MTN will ruthlessly execute AI Inside. I'll come back to the other two pillars. Why do we think we have the right to win in this space? Because we believe the execution risk is very low. We also know that the complexity is very low. Also, it's internal. It's only a function of your cost profile. So, the base of how much you can exploit is only the function of how much your cost profile looks like. So, it's pretty much ring-fenced.



So, what is the right to win? I'll say near absolute. And it's only capped at the cost base. What could be a challenge? Data integration capabilities, we must hurdle and fix them. And we're doing that. And any binding constraint could be how is management managing the organisational change capacity to absorb AI Inside. So, if you solve for the issue of binding constraint, if you are able to manage what could break the business case, essentially you can execute this like we're doing already, quite radically, quickly, and demonstrate value. And I'll give an indication of what my expectation is as we go forward we're going to unlock on this.

B2C, like I said, is a portfolio. So, if you think about AI, if you think about where we were in 2022, if you think about the chips profile, when the chips like Hopper were announced versus Blackwell, Vera Rubin, and I think Feynman, that's expected in 2028. You have to be very smart in terms of how you deploy capital and the choice of chips. You have to time your investment very smartly because these chips, as they evolve, they're evolving at the order of magnitude. So, you need to be very balanced in terms of your choices and the techs that you make in terms of investment.

So, what would be the concern for management? It would be the risk is a little bit higher and moderate compared to inside. Complexity is manageable. It's something that we're doing today. I think we can do it. Right to win, real but partial, I think we can execute that. What could be the challenges? What could break the model, could be the cost? Token economics. It comes down to the economics in terms of tokens. And of course, that's the plans that we're putting in place.

So, as we execute B2C, the assurance I'm giving you is that we are alive to the implications of every tower adoption. And by managing those accordingly to ensure that we drive the maximum upside possible. B2B but dealing with much more risk of execution is evident. I mean, you can see that globally, what's happening with the DCs and edge, and that we can see. Complexity is slightly higher compared to the other two towers. Contestable space, so you need to be able to box smart. And that's why I'm saying the trick of capital allocation is going to be very important, and the timing thereof is going to be very important. And of course, we have to deal with take-up rate, and this is where the model breaks quite aggressively at the energy level.

So, this gives you a perspective of how we have set up our stall, what we're negotiating, what we must solve for to make sure that we can unlock value across all the three towers. We will prioritise AI Inside, but we're executing B2C and B2B, but we're a little bit more nuanced in terms of timing and profiling in terms of capital allocation decision-making.

Let me give you a bit of a view on the **use cases**, because we all know that the last two years, for everyone across the world, I think it's been the years of **POCs**. I'm happy to inform you that the



markets have deployed this. We've heard Karl talk about this quite extensively; we are grateful to the Nigeria team for the work they've done. Many markets have come to play. So, you look at revenue uplift and assurance. I'll talk about NBx, which is hyper-personalisation deployed in many markets. We've been doing personalisation before. We are doing it. I'm talking about hyper-personalisation where we've got much more data set around the customer. If you get time, I suggest that you go into the lab and we'll show you the extent of now how micro we're becoming in terms of being targeted for customers purely using AI.

RA, very clear, SA, Cameroon, and then we're rolling out in a number of markets. Network, a big one. We're excited about what we're doing in markets like SA, largely on energy, and I'll touch a little bit on that. Customer experience, SIM registration, I'm going to give a bit of a deep dive on that use case. Voice-enabled chatbot that we've implemented in Nigeria, and of course, back-office transformation that we're doing. A quick example is what we intend to do and what we're doing on legal. I mean, we're putting pretty much all the contract profiles, all the contracts in one vault. We manage them centrally so the ability to draft and to amend contracts and to get the alert in case there's regulatory changes, we're able now to pick that up so that we can be able to manage this properly.

You have to see this as a portfolio. So, my ambition is that we get more value so that where we don't win, it doesn't actually crush the ambitions, we are able to neutralise areas where we cannot be successful. But we are prioritising the following. So, this gives you a sense.

On the **NBx**, we are doing personalisation across all the markets, but we are now going super micro on the level of personalisation. We have done this in six markets. We're going to roll it out at scale. 44 million customers reached across South Africa, Nigeria, Ghana, Cameroon, and then we're going to scale across all markets.

Revenue assurance, 10,000 data points. Basically, what the tool is giving us is what humans cannot be able to diagnose and to be able to fix. So, we're dealing with that in terms of revenue assurance.

SIM registration, one of our exciting use cases. I hope you can make a turn and have a look at that. This is the solution that we have taken from our team in Nigeria. So we do SIM registrations in Nigeria on a daily basis. Give or take, you've got about 200-plus employees doing eyeballing. So, a record comes in with biometric data into the centre. Human beings look at it and say, okay, this is Charles. This is Charles from the database centre. This is Charles from the biometric. Tick. Access into the network.



Today, we've put down 13 agents that are able to do this at scale faster and more accurately. 13 automated agents that work together to distribute load. And when I say agent, I mean agentic AI. That's what we have done today. And we expect that this solution will scale across many markets. We expect that should give us proper upside in terms of improvement, accuracy, compliance. But of course, there will be issue of governance, control, and human in the loop. So, I wanted to give you a perspective that these are **live use cases** that you can go and see the actual demo with the real data that shows what's happening in those markets as we speak.

Now, the MTN P&L says that circa 55% of total group opex comes from network and IT. And of course, if you think about the capex profile, 80% of the envelope sits in network and IT. So, it therefore follows that this is what we have to go after if we are to create value. And if you think about the P&L, you think about one of the biggest lines around tech is energy cost. So, we're going after that line. We're implementing AI with solid demonstrable value that we've seen in terms of savings per site.

Someone can say to me, but look, this is not the first time telcos talk about energy savings. But all I can tell you is that **the level of ingestion that we are doing, the number of parameters that AI can interrogate, are nothing compared to what we were able to do before.** So, we expect that we've done this in South Africa. In the Western Cape, we've rolled out a number of sites. We're seeing significant level of gains in terms of how you're going to go to manage that in the operations.

Another exciting one is, I'm sure investors will know about autonomous networks, level one to level four. So, how smart is a network and can it function by itself? We're working on deploying agents. We've built it in the SA network where we can deploy agents on the network. Essentially, what agents will be able to do is to help us with incident management, triaging of incidents as well. And to the extent possible, our ambition is to be able to ensure that they can tune some parameters through an approval process on the network. It's a significant gain for us. This is what every telco in the world is doing. And the assurance I'm leaving with the investors today is that we are not far compared to what everybody is doing in the world. I think we are moving at a faster rate.

Fibre cut sensing. We lose a lot of service today because of fibre cuts. We have a lot of challenges in terms of excavation, not necessarily because of how we manage it, but general excavation, road maintenance, and all of that. So, we are now turning the fibre network into a sensor network, which means that it actually observes the micro vibrations on the network and it picks up patterns. So, it starts to learn how the surrounding area of the fibre area is supposed to behave. Any form of a change in pattern of those fluctuations, it alerts us. So, when people are mobilising and before they put the TLB to dig, we're already there to be able to manage that and support ourselves. We

Commented [HG1]: Not sure that the meaning is clear here. It looks like it should be the other way around? Surely all the levels we did before are nothing compared to what we are doing now?
Grateful check with Charles. Tks

PS - I checked the audio. This is as he said it.



cannot find ourselves in a situation where our fibre is being cut and we don't know about it, and it takes eight hours to diagnose and to fix it. That time to repair is going to be completely narrowed. And we have demonstrated the solution and it's working very well for us.

RAN capex, smart capex, very, very exciting what we are demonstrating and we've deployed this. We are now able, with a significant level of accuracy, to forecast what we think the revenue profile and the traffic profile of a locality will look like in six months, 12 months, using all the ingestion of the AI parameters. This means with a significant level of accuracy, we can deploy our sites much more informed than what we were in the past. Huge savings and optimisation of a capex profile is what we're going to do. So, we're doing this for both radio access network and, of course, the fixed network as well.

Now, if you say, Charles, what is the construction of the formula? How are you driving this? How do we know if we are winning? How are you measuring? How are you tracking it? I'll say that you have to track if the company is capable. The second thing you must track, you must track if there's an adoption rate within the business. And then you must test the maturity at the tech level. And then you must curate and make sure that the use cases are impactful. What is the promise we're putting forward? We have a 2030 ambition, but **for AI intensity formula**, we are calling out that my expectation is that we need to deliver 80% of the P&L impact using AI Inside by 2028.

For that to hold true, a few variables must come forth. Adoption must improve to 70%. I'm comfortable that they should give us required leverage in the business. 40% adoption in terms of models and agents. Now, this number, someone will say, but why 40%? It sounds so low. But we have to remember that this is not about giving every employee access to models. This is not about everyone must have access to Claude and GPT. We're allocating model licences according to the level of usage and value generation. We don't want to find ourselves in a situation like many other companies who are now withdrawing access to models because they're over-provisioned without checking the economics. So, you have to time it very well.

So, it's going to be targeted. We're not going to say everybody must have access to Claude. It's an expensive model. It's quite hungry in terms of tokens. We're going to target it and say, Ralph, Exco, maybe so-and-so must have access to a Claude. Why? It's because it's a different model. You have to treat it differently. And you must isolate the level of usage according to value creation. So, the idea is not that the future is 100% model penetration in the business. It's a targeted and measured deployment of models. So, at circa 40%, we should be able to get to what we're looking for.



Now, the non-negotiable on this equation is IT maturity, because without proper IT governance, data, API capabilities, you really cannot deliver AI at all. We're indexing this thing as 80%. Hopefully, we get that to more in the top six markets. We have to make sure that our data lake is clean. We have to make sure that we have the right information. In the future, the whole construct and architecture of telecoms, of what people build, which is batch processed information, where you load information and you process it later, we have to move away from that.

The future is constant streaming of data into a data lake. It doesn't stop. So, the architecture needs to be able to do that if and when it happens. It doesn't have to wait for a best job to run for it to land into the lake. So, we have to fix those things. And then we have to sort out APIs. We invested in the API platform, I think around 2018. We're excited about what this platform has done for us. And now it's answering the question of AI. There's no AI without API capabilities.

We've done an amazing work in terms of the interface that we have built. And I'm putting AI governance here deliberately because in essence, if you don't manage governance, governance is a derailer, is a deduct essentially in terms of this. So, we have to make sure that we amplify alignment on governance. When this is done, we expect that there should definitely be some form of an uplift at the margin level, certainly customer experience, and also governance overall, if you think about security as well. We have what we call AI for security and security for AI, especially because of the pre- and post-Mythos world. We're a little bit more paranoid about the implications of AI in terms of business. We're doing that as well. So, a bit more clear on this equation.

So, the equation measures the 2028 ambition on AI Inside, though we're executing AI ambition for 2030 overall. But like I said, you need to make sure that you intensify the AI Inside much faster for you to be able to deliver B2C and B2B.

Now, a little bit more technical, but if someone asks and says, but if you think about the five stack or what they call the **five-layered cake of AI**, what is MTN doing on silicon? What are MTN's views around data centres? How do we intend to play around cloud? How do we see models? Particularly because we're talking about moving from large language models to small language models, where we can be able to start to create our own localised information and languages.

Our intention is not to take our rich languages and constant information and ship it abroad only to buy it back as intelligence. We expect that we must localise these models, the constant information, use it, and build intelligence for ourselves. Because if we don't do that, all we're doing is going to be an exportation of raw data and importation of intelligence. The expectation is that we'll build this. So, think about it this way. Silicon is a procuring game. And again, on silicon, we are



going to be measured. It's not the race to say who buys the first GPUs. It's going to be who buys the GPUs, who buys for inference. These chips differ depending on which workloads you are solving for.

In the past, it was a big focus around training. Training was more about the GPU game. As we move forward, we're moving towards LPUs and TPUs. So, it's going to be very important about how we make our choices here, but this is a procuring game. The data centre question is answered by Mazen. Cloud localised in our own DCs. Hybrid off premises, on premises. Models. Curate. And to the extent possible, because the secret sauce in terms of models deployment is being cracked wide open. These models are all open source, most of them. You can actually deploy them centrally, locally for ourselves. Everybody in this room can go to run a model on their local PC, by the way.

And then what are we going to do around applications? So, when you test the whole case for AI, people will tell you that money is concentrated at the bottom at this stage. So, it is the picks and shovels people who are the planning guys who are making the money. But the future of AI in terms of revenue generation lies at the top in terms of applications. That's where the biggest fight is going to be in terms of value generation. And that's why the whole B2C element for us starts to make more sense.

So, we intend to play on the DC at the procurement level. You understand what we're going to do around data centres and eventually what we intend to do around models.

What are we playing for? The promise we are making, and this is ambition, that three to five years through AI we must deliver **R30 billion value creation**. 50% of that R30 billion lives in AI Inside. This is what we can feel and touch every day.

And let me give a bit of comfort. We have done bottom-up in SA, working with McKinsey, and we're not too far in terms of what we believe AI Inside can unlock. This is going to be a number that is properly grounded on facts and use cases, market by market to make sure. So, we believe that we have a clear ambition that AI should be able to unlock R30 billion and 50% of that will be AI Inside, then B2C and then B2B. Of course, depending on what happens on the B2C, the number and the scale, who knows what the number becomes, but we're a little bit more certain in terms of our ability to be able to execute on AI Inside. Thank you so much. I'll leave it there and then I'll move on to take questions.

Nastassia Arendse

Commented [HG2]: Please confirm this.
Total AI value unlock (according to the slide) is R30bn in 3-5 years.
Of this, 50% is from AI inside.
The rest is from B2C and B2B



Thank you so much, Charles, for that very nice presentation. Lots to unpack there. And I'm hoping that I can unpack some of those themes with some of Mazen's aspects of his presentation and hopefully tie it together quite nicely. So, there's so much to go through and there's so much to ask, especially around the idea of AI, especially when we talk about AI infrastructure investment as well. So, I'm going to try and be quick with my questions.

So, Charles, let me start off with you. When we look at your presentation and we take in all that you have said and what the different leaders have presented as well, which part of the business is likely to be transformed first by AI if all the things you've mentioned actually start tracking? Are we likely to see it with customer experience? Is it more network operations or the fintech services?

Charles Molapisi

So, in my framing is that we expect AI to pretty much be in every segment of the business. But we have to be very pragmatic in terms of our focus areas because the idea here is that can we unlock value quickly? Because if we're able to unlock value quickly, we in a way set ourselves up for B2C and B2B. And to do that, then you must attack the bigger areas. So, **network** is a primary one that you are going after because we've got very strong partners there.

So, network, energy to be specific in network, operations to be specific, because if you think about the MTN P&L, the biggest cost sits around network, energy cost, managed services, operations. So, we want to attack that element on the P&L. It's imperative that we do that. But finance, finance operations, it's a clear one as well. Revenue assurance, legal, I think to help us to manage it. So, there are a number of areas, but I think to give you a bit of a clear answer, I'll say my expectation is that we're chasing value, and I think value at this stage sits largely in the network area.

Nastassia Arendse

Okay. Mazen, I want to bring you into the conversation because Charles just mentioned that we've got to be pragmatic. And I think as we become pragmatic, we also have to have an AI reality check. There's a lot of excitement around AI infrastructure globally. And when you think about it, what's the biggest misconception that investors have when it comes to the African AI infrastructure opportunity? When you're listening to that conversation and you're reading various reports, what's the one misconception we can dispel right now?

Mazen Mroué

I think first of all, what probably the external world doesn't know about is the excitement that's happening in our markets about technologies. I think there is already proven practices about the adoption of technology in our markets. So, where the other part of the world thinks we are



extremely behind, if you look at our network infrastructure, the electronics that we are using in our networks, actually they are the same electronics being utilised outside of Africa. So, that misconception, I believe, is behind the reality. And I believe we have a role as MTN to continue to innovate and definitely invest and co-invest in the infrastructure to bring the latest technologies up to the level where the consumers and the businesses are exposed and utilised effectively in business operations.

Nastassia Arendse

With that said, there's a lot of investments that are poured into data centre AI infrastructure. When you're having a conversation with the team, with the board, with the Exco, how do you distinguish between genuine long-term demand and what may ultimately prove to be over-investment?

Mazen Mroué

That's a very good question. And we are extremely cautious on the design of our real estate when it comes to data centres. So, it's very important for us to really construct the foundation, the property, the land. However, the actual finishing of our data centre properties, it's a demand-led process. And that's really what we are trying to ensure that there is a balanced approach in the investments.

So, we see, as an example, customers who are looking for hosting and customers looking for co-locations and other customers looking for installing AI-enabled solutions. Each one of them require different design, architecture, and SLA levels. And definitely, there is a big difference in investments between providing triple nines and five nines of service level of availability, because really, that also incurs a huge amount of cost of deployment. So, again, as Charles said, our strategy in deployment of data centres and AI-enabled infrastructure is very pragmatic and a demand-led process.

Charles Molapisi

Can I maybe add to the point that Mazen is making? Also, what makes us slightly different as a DC provider as MTN is because we also carry significant amount of internal load. So, while we are also targeting external third parties for this, there is an opportunity to make sure that this infrastructure can pay itself by using our own internal workloads. Because I think all of us need to understand that pretty much every data centre on the planet at some point has to transition to becoming an AI data centre, largely because the application sets that sit on top of this infrastructure eventually are going to be so inefficient to run on old computing. That's going to force everybody to upgrade. So, what he is doing now is essentially creating opportunity for MTN



internal workloads space to run for us also going forward, not just for third parties. So, in a way, it de-risks us as an organisation and also create an upside for him.

Nastassia Arendse

A lot of this is going to require talent. How are you thinking about retaining talent, attracting talent, if we had to have this AI at scale and the objectives that you've just presented really taking off here?

Charles Molapisi

First of all, on our own, we won't to have the capacity to do this. This is a partner game. The way we're doing this, we've pretty much spoken to a few partners already. And we're sort of like creating towers. So, we want to understand who's stronger when it comes to revenue assurance, who's strong in the finance portfolio. And when we work with partners, there's absolutely no way that as MTN will be able to anchor this all on our own. However, we are building a very strong software engineering capability internally. That also we will use to be able to augment that and eventually to scale up to an extent that is able to carry most of the load. But in the immediate, if you look at the race that we are on now, I think we're going to rely largely on collaboration with partners as well.

Nastassia Arendse

Okay. As I begin to wrap this conversation, how are you balancing innovation with AI governance or AI safety or however people want to frame that aspect of the safety/governance part?

Charles Molapisi

Non-negotiable governance on many levels. The creation of agents in the business, because if you don't manage the sprawling of agents, you're actually going to open the company to vulnerability, so non-negotiable on that. We have an AI steerco. That steerco manages all manner of governance. We have created a framework around the creation of agents in the business. We are governing this with Exco members who participate into the steerco. So, it's not just a technology thing. It's a big key part of this because, like we say, if you don't manage governance, essentially, you deduct all your gains that you make on AI.

Nastassia Arendse

Gentlemen, thank you so much for engaging with me and unpacking in greater detail some of the key themes here. We're going to wrap it up there. Thank you so much, Charles and Mazen, for engaging in that conversation.



*End of session 4.
Edited for accuracy.*

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