Maybe 2, if I can, for Sundar. One, on the commerce initiatives, a lot of announcements from the company in the quarter, moving towards sort of commission-free and amplifying both the advertising and e-commerce efforts. I want to understand some of the moves you're making strategically and how you think that positions you broadly against, obviously, an e-commerce landscape that's seeing a lot of pulled forward penetration given the current environment. And second on YouTube, obviously, a fairly volatile brand advertising environment and TV advertising remains in flux. What are the opportunities both in the U.S. and globally to go after sort of TV ad budgets under the YouTube umbrella?

On Shopping, I spoke a little bit in my remarks, but really excited at the potential there. The team has been executing very well. Overall, users come to Google a lot to find the products they are looking for, but we see an opportunity to invest and make the experience better. Sometimes the journeys may fail because they don't find what they're looking for. So we want to make sure it's comprehensive.

Next when people find what they like, we want to make it simple for them to transact. And so working on that end-to-end experience has been a big focus. And obviously, making sure for merchants, really making sure we are open to business for merchants, and we are giving value to them has been the focus. The early indications are that users are responding positively, both in terms of user engagement and more importantly, giving value back to merchants for their investment there. So in some ways, it's a return to our first principles. We want to ensure that Google is the best place for merchants to connect with users. And so I'm excited by it, and you'll continue to see us focus in this area.

The second was on YouTube brand. Obviously, YouTube has been doing well in terms of engagement and watch time. And so we see a long-term opportunity there. We've had strength on direct response as well through this quarter. But on brand, which was your question, we are obviously investing not just in YouTube main product, YouTube TV as well. And so areas where we can offer a bundle, advertisers are interested in streaming, and so bringing that bundle together, especially to advertisers and upfronts through YouTube Select is a big opportunity as well. So we are focused on that.

And our next question comes from Doug Anmuth from JPMorgan.

I have 2. Just first, Ruth, curious if you can just talk about the cost structure a little bit more. We know you'll continue to invest to drive growth over the long term. Just curious how you're thinking about it as the top line starts to recover more hopefully over coming quarters. And then secondly, I know you said that search trends were flat to last year by the end of June. Just curious if there's anything you could add in terms of what you've seen more recently over the last month as well.

Thanks for this, Doug. So in terms of cost structure, as we talked about last quarter, we have been focused on taking steps to enhance efficiency in the near term. And that being said, as Sundar and I both noted, what you're seeing is the fact that we do remain focused on investing for the long term. So sort of breaking that down in cost of revenues, while TAC and content acquisition costs are obviously tied to revenues, there is a sizable percentage of other cost of revenues that are not directly correlated with revenue growth, as I noted in opening comments, and we are very focused on the user experience and the overall ecosystem. So we are investing to make sure that we're supporting our products so they remain reliable in all environments.

And then in OpEx, much of our operating expense is generally less variable and not necessarily correlating to revenues in the near term. So in terms of a couple of the items, although we do continue to expect the year-on-year headcount growth rate to decelerate, as I noted, we are hiring aggressively in priority areas like Cloud. And so we're taking near-term steps to enhance efficiency but still investing for the long term. So we're trying to make sure that we're getting those tradeoffs right. And as I noted, we do expect the year-on-year headcount growth rate in 2020 to be down somewhat from the 20% year-on-year rate last year, and that's even adjusting for 2 items that put upward pressure on headcount growth. The first, we're moving certain customer support roles from third-party vendors to Google's in-house operation center. That is actually OpEx neutral, but does increase reported spend. And then second, the pending acquisition of Fitbit. So we're trying to navigate it appropriately.

In terms of your second question, in terms of search trends and what we saw throughout the quarter, I would say that following a rough end to the first quarter, ads revenue gradually improved in the quarter, not only in Search, but YouTube and Network. And so for Search, we ended March at a mid-teens percentage decline in year-on-year revenues. And then as we progressed through the second quarter, we saw a gradual return in user search activity to more commercial topics, and then that was followed by an increase in spending by advertisers. So that resulted in a gradual improvement in year-on-year Search revenue trends in the second quarter. We ended basically flat to last year by the end of June and you know to carry it forward, although we're pleased that ads revenue gradually improved throughout the quarter.

As I said, we do believe it's premature to say, they were out of the woods given the fragile nature of the macro environment. And as you're aware, ad spend does tend to be correlated with macroeconomic performance. And so the macro backdrop will continue to be a key signal to monitor. But to your question, based on our estimates from the end of June through last quarter, there has been a modest improvement in July.

And our next question comes from Heather Bellini from Goldman Sachs.

I just wanted to ask a question on -- 2 questions related to Google Cloud, if I could. One, Sundar, I was wondering if you could share with us how you've seen the change in pace of customers migrating workloads to the cloud given COVID? And I'm also wondering if you could share with us kind of the puts and takes, and Microsoft talked about this a little bit last week with their Azure business, but for those that have accelerated workload migration to the cloud, how much has that offset the impacted industries or companies that you might be serving where they're seeing lower utilization than what they normally do of cloud capacity? So if you can kind of talk about the puts and takes to the growth as well, that would be great.

Thanks, Heather. Overall, from my vantage point, obviously with Google Cloud, we've been investing to scale up, especially on the people side, on engineering, go-to-market and then, obviously on our investment side with data centers, cloud regions and so on. And so for me, it's been good to see as we are scaling up, we are executing more effectively. I've been personally involved in many, many conversations last quarter. We had many large customers come on to cloud, big telco deals and banking deals, Deutsche Bank, as an example. So overall, I felt the momentum was strong. Generally, felt like things were continuing well through the course. Felt like more a secular interest in our digital transformation companies are deeply thinking long term and planning for us. So overall, I felt at the moment, almost there. And I felt our execution as we are scaling up. Obviously, we are scaling up a lot. And so it's -- the combination is working well.

Your second question in terms of puts and takes. Overall, I think there are -- I won't -- I don't know whether there's anything significant worth for me highlighting. Obviously, you are right to point out that it doesn't affect everyone the same, but nothing significant for me to highlight here today.

And our next question comes from Brian Nowak from Morgan Stanley.

I have 2. The first one, Sundar, we try to always figure out changes in consumer behavior. I guess as you have sort of been studying what people have been doing through shelter-in-place and from the way things are changing from a consumer perspective, talk to us about areas you're most focused on, investing in and driving your teams to create new products to really help consumers with their changing habits. And then the second one, Ruth, I know as we sort of we look ahead with potentially a larger percentage of the workforce, work remote or work from home, without looking for quantification, maybe just talk to us about some puts and takes to areas where you could see either efficiency or higher potential costs from a larger percentage of the workforce being remote over the long term.

Yes. On the first one, when there is -- the shift to online is profound. We see people engaging a lot, doing newer things than they did before. People's interests have -- are broadening, I would say, across the board. And so for example, we are -- for me, I'm looking at different types of user journeys and making sure each of them is getting deeper and better. So for example, in Google, as people have started coming for more health-related information, how is that experience working, thinking about that for the long-term and investing in it. I obviously spoke about shopping earlier, and that's been a big focus for us. Education in general. And when we think through small, medium businesses and bigger companies thinking through collaboration, where G Suites' potential is, the investments we are undertaking, all that is very exciting to me.

But I would say cutting underneath all that, maybe while we didn't talk about it, really focused on our AI teams doing the investments they need, evolving our next-generation TPUs and the team's building better models and better algorithms. All that, I think, our ability to do more things is something I'm really interested in and focused on as well. So that's something I'm excited about -- for the longer term.

And then in terms of your question about work-from-home, I think it's a great point because it obviously feeds so much into a lot of the product work that we're doing in Cloud through G Suite, et cetera. So that's where I would actually start, but I appreciate what you're asking is how are we looking at our own cost base. And we called that out last quarter, in particular, with respect to CapEx, and you can sort of see it here this quarter. The main change in CapEx has really been we slowed the pace on the office facilities front. And what we're looking at is really how to reimagine what the workplace will look like. We continue to be very much focused on the fact that place and space are important. We believe in collaboration. Serendipity is key to innovation. So we do view space in office as important and are very focused on what does that mean over the long term.

We've actually opened quite a number of our offices, in fact, in 40 countries and do hope to reopen in many more. But your question to what does it mean for overall cost structure, we're looking at that with the place you see it now is in our CapEx, and the way we've been looking at it and our indication that we do expect 2020 will be lower CapEx on the facility side as a result.

And our next question comes from Brent Thill from Jefferies.

I was just curious if you could just comment in terms of some of the near-term business trends and anything that's changed as you've gone through the month of July versus what you saw in June?

Sure. I already commented on that with respect to Search, but to broaden it a bit more, and again, this is based on estimates from the end of June through last week. So for YouTube, we ended March with a year-on-year growth rate in the high single digits, and that's reflecting a substantial headwind from brand. The headwind from brand moderated modestly at the end of the second quarter, and then we saw a further improvement in July. Direct response has been consistently strong.

For Network, revenues improved toward the end of the second quarter, and we have seen a further slight improvement in July. Obviously, 3 weeks is not a quarter, but that's based on the estimates here from the end of June. And then as Sundar and I both said, when you look at, for example, Cloud, it has maintained its strength consistently. And I'd say that with a business that's growing at this pace, it's really much more about a secular trend to the move to cloud. So really nothing to comment on there.

And our next question comes from Justin Post from Bank of America.

Great. Sundar, I don't know how much you can comment on the regulatory environment, but it's obviously top of mind with the hearing yesterday. Maybe just characterize it for Google right now. And are you seeing any progress with the regulatory environment? And then secondly, we saw the YouTube TV price increase, a pretty interesting business model. But longer term, do you see that as really strategically important for the YouTube brand? Or do you think you can have a really profitable business on that?

On the regulatory front, we've obviously been operating under scrutiny for a while, and we realize, at our scale, that's appropriate. And we've engaged constructively across jurisdictions. And from my standpoint, I'm confident in the approach we take, our focus on users and in the evidence in almost all areas we operate in. We expand choice or overall lower prices. And it's -- overall, there's a very fast pace of innovation. So it's dynamic and competitive.

Having said that, obviously, we will operate based on the rules. And so to the extent there are any areas where we need to adapt, we will. And as a company, I think we will be, I think, being flexible around those things is important, I think. I think the scrutiny is going to be here for a while, and so we are committed to working through it. On the second question around YouTube TV, yes, there is -- I mean it's a good question. I spoke earlier about even from a brand and how people think about it, they are interested in streaming. So as YouTube TV gets more scale, I think we will see more opportunities there. We are obviously still in the early stages of building out the product. And just recently, we've added a bunch of new channels and making sure it's working well.

In the U.S., the TV market is a big part of the advertising market, too. So overall, if we can invest here and scale up, I think the synergies with YouTube will become more meaningful over time. And so excited the traction the product is getting. But still too early.

And our next question comes from Kevin Rippey from Evercore.

This one is for Sundar. I was hoping you might be able to expand on the earlier comment you made about the AI strategy. I'm particularly wondering, if there's been things over the past 5 months since the pandemic began, that you thought an expansion of a very high strategy or an evolution of the past strategy might be able to solve for whether that relates to commercialization or monetization or really anything across the business. Just really, really curious.

An area which -- first of all, across the board, the progress is steep. So I'm very happy with the pace at which our R&D on AI is progressing. And for me, it's important that we are state-of-the-art as a company, and we are leading. And to me, I'm excited at the pace at which our engineering and R&D teams are working both across Google and DeepMind. So I'm excited about it. Specifically, we are making good progress in areas like language understanding. And you saw some improvements last year, significant improvements with BERT and Search. But BERT took us a few years to get there. But things like that, I see more stuff in the future. And so excited by it.

An area where I think we are still under-tapped vis-à-vis potential is definitely Cloud. We see the potential there. But -- and I think it's a bit related to Heather's question, too. I think companies are thinking about migrating workloads and so on. But the longer run opportunity of actually using AI to truly have business solutions for you for whatever industry you are in, that feels like there's a lot of potential, and we are still very early there. And so part of it is, for us, connecting the dots internally and bringing it as solutions to our users. We have done it in certain product areas, but I see there's a bigger opportunity in the future.

And our next question comes from Ross Sandler from Barclays.

Great. I just had 2 questions. First, on YouTube subscription. So can you talk about the size of that area of the business relative to that $15 billion? We had it at about 15% of total YouTube revenue. And then how is the faster growth in that area relative to advertising impacting your long-term profitability goals at YouTube? And then the second question is on Search. So it sounds like the flat exit run rate year-on-year is pretty encouraging. If we strip out travel, I'm guessing it's well above that. So how would you characterize the query growth versus just the ad auction dynamics outside of travel across the other categories? Are we back to pre-COVID levels in those areas?

So in terms of the first question, we haven't broken out the specifics within the YouTube subscription revenues. YouTube subscriptions are in other revenues, it's not in advertising revenues. And overall, as we think about the opportunity -- our view is -- and we talked about this when we were launching the subscription product, it was really responsive to what we were hearing from users. And as we look at it, music is a key part of the overall YouTube experience. It's an important component of watch time. And what we found is that users wanted -- they wanted choice and some wanted a premium YouTube experience with ad-free viewing and the ability to download songs and videos. And that was really the impetus.

In addition, YouTube Premium provides additional revenue streams for music labels and publishers. So for example, in 2019, YouTube paid the music industry over $3 billion. And what we've done is meaningfully ramp our geographic presence from 5 countries in the beginning of 2018 to 94 countries today. And earlier this year, we announced that YouTube Premium had more than 20 million paid subscribers, up more than 60% versus the prior year. So our subscriber numbers have continued to grow there, and it really was driven by the goal to give users choice.

And our next question comes from Colin Sebastian from Baird.

I guess maybe a follow-up to the earlier question on commerce. Beyond the marketplace functionality and some of the free year promotional transactions, I wonder how some of the other initiatives are going to play a role. And things I'm thinking specifically are, were you focused before on Google Checkout and Maps and some of the assistant functionality, how those may play a changing role in commerce on the Google platform.

Yes. Great question. I think the bar is to have that super simple experience, which is delightful and that you have peace of mind and satisfaction in terms of getting the product and being able to return it and so on. So the end-to-end funnel matters a lot. And part of the reason why through the changes, a couple of things we have done. As you saw, we changed and we removed the commission for merchants to be on the platform. And part of it is by removing that. They can take that and invest in, be it shipping, be it delivery, be it the customer experience. And so that matters, matters I think in the overall experience.

And from our standpoint, the Buy on Google experience is something which deeply investing in. Obviously, our integrations with PayPal, our investments are underlying it to make sure for a lot of users that it's as close to a one-click experience as possible is a big part of the investment as well.

And our final question comes from the line of Mark Mahaney from RBC.

I want to ask a broad question about Google. Google's place or position, whatever, in online retail. And I asked this because Google has also -- obviously been central. Search has been central, but also YouTube has been central to commerce, online commerce for the last 20 years. We've gone through this pandemic where there's a real inflection point. We see it in Amazon's results. We see it in Shopify's results. And I'm not sure I see it in Google's results. So just talk about how you think, broadly, Google is positioned for what's really been like a 2- or 3-year pull-forward in accelerated ramp up of online retail demand. And are you positioned the way you want to be positioned now? Are there things you need to make to the -- changes you needed to make the products and services to be better positioned?

Obviously, I think as a company, our strength comes from the diverse categories in which we serve users, right? And it's not just product, it's services, it's wide areas, including areas like travel. So it's diversified. And -- but it also means through a pandemic, there are areas of strength, but there are areas of -- areas where you get impacted as well. So I think that's what is reflected in what you see. On e-commerce, you're right, direct e-commerce providers are seeing a big inflection point. But in it are essential categories like groceries and stuff, which are built in, which we don't directly play in. But to us, the reason we are doing this long-term focused effort on shopping with the new leadership team is to precisely make sure as a platform, we are improving and as the shift continues, Google continues to be an important place by which people come and participate in those journeys.

So long run, I see a growth opportunity with related to what we are investing in there as well. Not just through Search, but a Search in the Shopping investments we are making, but in YouTube, and also helping retailers on the cloud side. It's an area where there's naturally a lot of interest to work -- to partner with Google, and so we see that as a big opportunity as well.

And that concludes our question-and-answer session for today. I'd like to turn the conference back over to Jim Friedland for any closing remarks.

Thanks, everyone, for joining us today. We know you all have a busy evening. We look forward to speaking with you again on our third quarter 2020 call. Thank you, and have a good evening.

Ladies and gentlemen, this concludes today's conference call. Thank you for participating. You may now disconnect.