ISOJ 2020: Day 2, Brunch Workshop

Artificial Intelligence and Machine Learning in the Newsroom

- **Michael Grant, Teacher Fellow, Google News Initiative (workshop in English)**

Mallary Tenore Hi, everyone, and welcome to our workshop today. I'm very excited that you're here. I'm Mallary Tenore, associate director of the Knight Center for Journalism and the Americas at the Moody College of Communication at the University of Texas at Austin. And I'm so glad you'll be joining us for this workshop, which was made possible by Google News initiatives.

Before we get started, I just want to remind you of a few notes. We are going to be live streaming this session to our YouTube channel. So if you have any technical issues at all with Zoom, you can always tune in to the YouTube channel, and we'll be posting a link to that in the chat feature within Zoom. I also want to remind you to use the hashtag #ISOJ2020 to tweet out highlights on social media and to stay connected with the conference there.

So now I would like to introduce you to Michael Grant, who is a teaching fellow at Google News Initiative. He'll be leading us through a workshop called Artificial Intelligence and Machine Learning in the Newsroom. The power of AI and machine learning is helping journalists around the world in a variety of ways, both big and small. In this workshop, we'll find out how those technologies can help you make sense of large datasets, find patterns and pictures, audio and text, as well as enhance your workflow in powerful ways. So we're excited to be offering this workshop, which wouldn't be possible without Google News Initiative's support. And as you're listening to the workshop, please feel free to submit questions in the chat feature of Zoom, and we'll do our best to address those. So without further ado, I'd like to turn it over to our workshop instructor, Michael Grant.

Michael Grant Well, thank you so much for the warm welcome. Again, I'm a teaching fellow at the Google News Lab based here in Menlo Park, where it's about 9:30. So good morning, good afternoon and good evening in some places around the world.

So today, we're going to talk about artificial intelligence, machine learning and robots in the newsroom. So it's a super interesting topic. I think a lot of people are trying to understand more about it. And so this should be a pretty nice primer on a lot of the things that are happening in the space.

So to get started, I'd love to talk a little bit about what artificial intelligence is, and so the definition that I'll lead with is that it's a set of ideas, technologies and techniques related to the ability of a computer system to perform tasks that normally require human intelligence. So it's kind of like the idea of assigning tasks to a computer to carry out functions. I'd love to start with this video too. (Plays video.)

"This is not a situation where robots are going to be replacing what journalists do. The bigger question is how do we deploy machine learning to actually make us better

journalists? Every day in journalism, we're doing a lot of processing robotic tasks to make sure that we're gathering news, producing news at scale. The way in which I see a big benefit coming from AI is helping with that process. It empowers our journalists to spend more time doing what they do best: interviews, research and investigation and writing more compelling and creative content. Those things cannot be done by AI. At Google, we believe that eyes should benefit society. This means beneficial for the news that people have access to and the news industry who produces it. This report is an unprecedented insight into a whole range of newsrooms around the world. It tells us what they're doing with AI right now, but it also tells us what they hope to do with it in the future. We can use algorithms to help us find news faster and break news faster. These days any journalist or any reader will tell you they're completely overwhelmed with information. AI and technology can help with this process by finding relevancy. In the production area, you're looking at what can machines do really well, which is analyze data, pull things together, find patterns and even do some natural language processing to write stories off the back of data. We employ AI to provide users with more personalized experiences while maintaining the balance of curation to minimize filter bubbles. AI will help us to get exactly the right content to the right person. And that might be a consumer scrolling through on their mobile phone. Or for Reuters, it might be a business client who wants particular content at particular times of the day. Any new technology brings all sorts of challenges to the news industry, and one as complex as AI makes that even more interesting. Clearly, there are ethical questions that need to be addressed, things like making sure that our data is not biased or figuring out whether we're going to disclose the uses of automation to audiences. I feel that we're going to need to have new skills in the newsroom of people who understand technology and programing and understand the ethics of journalism. And we have Q&A sessions on AI initiatives, so that editorial has a good understanding of what we're actually building, what's feeding into it and what the outcome is. This type of transparency within our organization is really fundamental to how we build AI. We're all going to be living in a world where AI is ever more significant in all sorts of spheres. And I think it's really important that we understand both the powers and opportunities that they bring, but also the challenges and risks. The more all of us work together, the more confident I am we'll discover further how AI can empower journalists. That's why it's so important that we keep this research of this dialog going."

Wonderful. So that was a really good report, and if you caught that Bitly link, it's a great way to resurface that report. We'll give it another mention a bit later on in this presentation.

But I want to take a quick moment to talk about machine learning. And so machine learning is the science of getting computers to act without being explicitly programed. And so we're really talking about, you know, with AI machine learning how we can use these technologies as tools in journalism. And so machine learning, for instance, is already in existence in our environment. And we're already seeing it more and more in our everyday lives and in products that we're interacting with. And so some examples of ML in everyday technologies include things like GPS, Google Maps, and you might be familiar with Google X's Ways, which is a really awesome self-driving technology car. And so streaming services like Netflix and Spotify are leveraging it as well as Google search. So in this presentation, we'll go through a few of the ways that it's actually being used in practice.

So one really great example that you may or may not be familiar with is Trent, or you may have already used Google Translate, for instance. And those are good examples of where machine learning is helping with translation tools or transcription.

So whatever the role is in newsrooms or as a freelance journalist, you can really start to figure out how to tap in to some of the products that are available on the market that leverage the power of machine learning. One really great Easter egg in Google Docs, for instance, is voice typing, and so voice typing is really awesome because all you have to do is go to the tools menu. And there's a setting called voice typing. And it'll give you an icon that you click, and then you just start talking, and it'll transcribe right on the fly. So that's a really nice hack for journalists. And you can also maybe take your prerecorded audio and maybe play it up to your computer, and it'll be transcribing from your notes. So I'd love for you to leverage that application of machine learning and transcription.

We're starting to see this as well and other things that we interact with, like smart playlists, and that's everything from Spotify to maybe like your iTunes.

So there is a really wonderful journalism and machine learning report, and the Google News Initiative helped contribute and sponsor this report. It's with the London School of Economics and Political Science, and so it's a really great summary of a lot of what the video was talking about. So how journalists are able to use machine learning, and automation, and AI and the uses of journalism.

And so what can machine learning do in a newsroom? The applications are nearly endless, and I think we're just starting to scratch the surface in how we can start to leverage these things. So machine learning in news gathering, for instance, is already at work at Thomson Reuters, and so they developed a news tracer and Lynx Insight. So both tools use machine learning and artificial intelligence technologies to support Reuters journalists in the news gathering process. So the tracer is designed to help journalists detect activity on Twitter, particularly breaking news. And so it analyzes millions of tweets to identify possible articles and allow newsrooms to detect those breaking news scenarios. So it's kind of like getting ahead of the jump in interest and being able to identify when we should go out and report something. So you can think of it as a reactionary kind of product there. And then Lynx Insight is designed to identify trends and key factors in larger data sets, suggesting new articles to reporters and providing additional context and background information. So really great products that Reuters is already experimenting with.

So I'm going to break this into three sections, and the first part we will dive into is how we can use machine learning and AI to gather news. So here's a quick example of a news gathering method, and so I will quickly show this video here. (Plays video.)

"Hi, I'm Chelsea. Today, I'd like to give you a demonstration of the technology and the reference to software flow that a customer can use to develop your network applications based off the DSP technology. This a very high performance DSP designed for vision and network applications. Our partners have made the Vision DSP processor into a fully optimized, customizable and advanced geometry note. This is a platform that we use for customers and partners to develop applications. We also developed a neo-network compiler and a set of libraries called XICM Library that can be utilized by customers to develop new network applications. Here I'm showing a very streamlined flow. We can start with any publicly available framework through the network training it can be optimized the network architecture and the coefficients. Then we see in the training to model directly for the network compiler. The neo network compiler optimize the layer structure that's colonization and then eventually map and generally they optimize the code using the access library function pulse."

OK, so that might be leaning on the technical side, but in summary, we're using AI, in this case, for image classification and object recognition. And here's another really interesting example here. So this is called image tagger, and it's a software program on a PC. And the way it works is you can take a number of images, as seen here, and you can drag the folder to the application, and hit, run. And so the machine learning is happening in the background to understand what's the composition of the photo, and you can see it processing those right there. And then now you can see that it's assigned keywords to each one of these images like "desktop computer," "racecar," "goldfish," "space shuttle" and so on.

So we're seeing that there's ways that programmers can bring these kinds of tools to the public. And as journalists, we should be thinking about, well, how can we start to use some of these programs for our own use?

I see a question about the voice transcription function in Google Docs. And just really quickly, I want to note that there are, I believe, about 40 languages that are present, and so there is an option under the recording part where you can choose the language. And so if you're speaking in your language, it will translate in that language.

So here's another example of AI and news finding. (Plays video.)

So this tool is about ife live checking. So just in summary, the tool that Chequeado is using here is basically allowing for the transcription of speech, and then being able to then run AI to fact-check, and say whether some phrase is fact-checkable. So it's really awesome. I won't go through the entire video and pain you through reading a translation. But I think this is just another really awesome example.

Let's just talk about news production now. So machine learning for news production is another key area, and so tools that use machine learning to reduce the time spent transcribing or translating information are good examples of how this technology can be useful in the press industry. But the use of machine learning in news production goes much further. A wide variety of media, including Bloomberg, The Washington Post and the Associated Press, have begun applying different machine learning and artificial intelligence techniques to automatically produce news articles at scale. So the main objective is that journalists can focus on the most creative aspects of their work, as far as like delegating or doing redundant tasks. And recent case studies show the benefits might exceed our expectations. And so we'll take a look at some of these. (Plays video.)

"Sports journalists have an important but difficult role to play in soccer matches. They need to simultaneously follow everything that happens during the match and write a high-quality article. After the match ends, the report has to be complete and ready, even if the gold is made in the very last minute. Few extra hands wouldn't go amiss. Pass was developed by journalists for journalists. It's a powerful tool that keeps track of all the match statistics in real time and builds a report from that. The journalist then bases their articles on the Pass match report. This saves journalists time and eliminates the need for time consuming, repetitive tasks, so they can focus their attention on capturing the atmosphere and covering the player's background stories. Pass allows journalists to write rich, detailed articles about matches quickly. For more information, please check our website."

Great, so that's just one example of a use of AI in sports, and you can imagine that kind of approach could be used for things like business and performance charts for stocks and markets.

Another interesting use of AI in journalism is a tool called Wordsmith by Automated Insights, and so you can see here that it shows that each story is a collection of data. And so it can log things like tables, graphs, list and so on. And so you're seeing some of the keywords here that are highlighted, and so it's helping to write these stories based on some of the things that it understands about the subject matter. So the software scours through its trove of data looking for insights in facts that it can figure out from the data. Like a human journalist, it's trying to understand the questions that might be there or questions that people might ask.

And so I had the privilege of interviewing some folks from the team during my fellowship year, for instance, and understanding more about how Automated Insights is thinking about this. And so it's now being used by some larger publishers. And it really does help fill holes in our journalism coverage, particularly where maybe the amount of content that needs to be produced in the area can be supplemented by the use of a machine like AI to draft and produce the text. So it's really interesting here.

So Wordsmith uses a virtual tree, each branch of the tree is a possible way to tell the story. And so by comparing the data, you can decide which branche it should follow. The sentence was only included because it decided the reserve scored particularly well. So it's trying to understand and analyze performance based on what it's understanding about the content that it's pulling from. Very interesting.

So the Associated Press found answers and automation with the Wordsmith platform and Automated Insights. To support journalists, AP began automating NCAA Division One men's basketball previews during the 2018 season, using Wordsmith and data from the stats platform.

So, again, this is really great for supplemental, where we might not want to throw our resources into things that are super high octane, and there's just tons of content that we'd have a hard time even covering with manpower. So this is a great instance where we can throw technology at that particular problem and start to really surface things that might be useful to an audience, and so AP is taking advantage of this approach.

Vice is also taking advantage of machine learning. And so machine learning can help expand the reach of local language news content. So, for example, in this Vice example, editors at Vice published articles in 18 different languages. And so they tapped into the technology of Google Translate, which is powered by machine learning, and so they were able to integrate this into their content management system and then translate for other languages. So really awesome use of taking some of the technology that's out there, particularly in this case from Google, and being able to integrate that into what they have to offer their customer.

Lexio is a really interesting new tool as well, and so it says you can use data to basically tell a story. So let's take a quick look at that. (Plays video.)

"Hi, I'm Stew, and here's a one-minute demo overview of Lexio. First, it's important to note the Lexio is accessible from both your browser as well as the Lexio app on your phone. After logging in, the first thing you see is the news feed. Here you'll have cards from all different areas of your business that you've connected to Lexio. Talk to your admin if you'd like to get connected to more data. Here users can set up different topics to help filter your feed. Notice that I have a ton here set up already for different functional areas of a

business, things like sales, customer success, marketing, HR, and more. If you see a card that looks interesting to you, and you want to dive deeper, just click on the card and Lexio will write an entire story for you. Everything you see here is written by Lexio, and users have a ton of functionality to change time frames, add filters, to share with other people, comment and more. Lexio's user interface makes it easy for anyone to break down the data to get the information they need to be successful. Have any questions? Don't hesitate to reach out to our team."

Awesome. So that's another approach to being able to generate storytelling from a data set. All right, and then I'll take questions or I'll read through the questions when we come to the end of the presentation. So don't worry, I'll try my best to answer as many of them as I can.

So next, we'll talk about news distribution. Machine learning for a news distribution is another really great opportunity in journalism, and so Yle News Lab of the Finnish Public Broadcasting Company used machine learning to create Voitto smart news assistant for its NewsWatch application. And so the assistant is hosted on the lock screen of mobile devices, and it recommends interesting news content to the user through alerts and notifications. It leverages machine learning to improve its recommendations, and it learns from user interactions on the lock screen. So this is kind of like learning from the user right on the application. And so, in addition, the user can teach the assistant feedback directly through notifications and in the news application itself.

So machine learning can also help news organizations improve their business model. For example, adjusting flexible payment pages for your subscribers. So in this example, content is being sourced around user's interests, and so this definitely aligns with personalization and hopefully hitting on some of the key interest of the user in order to really just be a display of value in every piece of content.

This Neiman post, I think, hits the nail on the head, where it says, "Not all news site visitors are created equal. So Schibsted is trying to predict the ones who will pay up." And so being able to get insights into what the users are there for is really great when you're when we're coming up with a call to action. And so I highly recommend that you take a look at reading this article, because it really is kind of the direction that we're starting to see news organizations go in. And that might be a great opportunity for your news organization.

So The Times is also playing with this approach to personalizing news pages and creating calls to action and being able to start to see if there's a difference in monetization between just kind of surfacing the curation versus doing it based around a user's like reading history.

This is a really interesting tool being used by The New York Times, and so we can use machine learning in newsrooms to encourage healthy, productive conversations. And we know that comments can be quite toxic. And so this is a toxicity scale. And so by adjusting the slider, we can accept or deny certain types of commenting based on the toxicity of the content that we're seeing there. So a very fascinating use of using machine learning. And this is part of a project with Jigsaw, which is also a Google company that is doing a lot in understanding approaches to machine learning and AI in journalism.

OK, so this example is how we might train custom machine learning models, so there's a cloud AutoML, which is a suite of machine learning products that enables developers with limited machine learning expertize to train quality models. And so I think this is a very

simplistic but understandable example of what it looks like to train a model. All right. And so AutoML's vision is to be the first product to be released, and it's simple, secure and flexible ML service that lets you train custom vision models for your own use cases. So they have some really exciting things brewing over there that we should pay attention to.

Next, this is just a really wonderful example of using machine learning to identify photos, and so there were thousands of photos fed to a machine. We're able to then detail and tag the images that are there. So I guess resurfacing archive photos and being able to group them and categorize them is a really powerful way that we can reinvigorate some of our old and existing content by running our imageries through machine learning in order to organize that into something that's a lot more digestible and easily findable. So this comes from Google Arts and Culture with Time Life.

The ICIJ did a really fascinating investigation of looting the seas, and that is basically pirates that do illegal fishing. And so this has had a major environmental impact on journalism, so the series on overfishing in the Pacific was a classic data-driven investigative story. And reporters asked for data from the government. The government says no. So they then ask again. And finally they received data through sources and began to explore and look at that data. All right. It's very time consuming to look through large amounts of data, and so sometimes we might consider how we might leverage the power of technology to do that.

One incredible application that has been built around global fishing data is the Global Fishing Watch. All right, and so this was also built in collaboration with Google. And so this is real time data being fed into the application so that we around the world in several parts of society, but journalist as well, or governments, we can start to monitor where activity is occurring.

This is more or less how it works, so we have ship movement data being sent to a place. We have localization happening. There is training data that's being labeled, and then it's being batched in and then fed into the the application where we can then visualize it.

So there's a lot happening in the background. But for the user, it's really great that you can just go to the interface, which looks like this, and start to explore that data with lots of ways that you can filter, or look at specific types of data, track down certain ships and vessels, or see like where in the world, let's say, where there is restrictions on fishing, where you can see vessels starting to enter that area. And so if that's happening, that sounds like a really big opportunity to report. So here are some examples of what's being tracked using location data on vessels.

So this led to reporting recently about illegal fishing as well, which resulted in a $2.2 million dollar fine of one fishery. And so, again, these are opportunities that the data presents us in sourcing new reporting that's super important to all of our lives, and the food chain, and the fate of a fish in the sea.

So Global Fishing Watch has now made this public data, and it's working with the research community and NGOs to broaden the reach of this data to potentially track not only overfishing, but to help build more sustainable supply chains of fish.

The New York Times has also leveraged that data in its storytelling and told a really fascinating story in this example, which I encourage you to check out.

And we can also still tell stories about how environmental disasters like oil spills can affect food supply, and so this example comes from Reuters Graphics.

Other news organizations are also experimenting with machine learning in their reporting, so last year, BuzzFeed did a really interesting story about hidden spy planes. So it's analyzing activity of planes in the sky and pairing that knowledge of the course of planes with deep investigative reporting, they were able to show or understand which one of these planes were hidden spy planes.

And Google did a project with ProPublica documenting hate, which uses AI to generate a national database of hate crimes and bias incidents. That was super interesting because there isn't one central database for tracking hate crime. And so this is definitely an example of being able to compile lots of reports and start to turn that into a repository that helps journalists source more reporting and start adding new reporting.

And so the team used Google's Natural Language API, to scan a raw feed of Google News alerts, and it pulls out information about people, locations, events and identifies potential incidents of hate crimes. And so that's a really great starting point to having something of an index. They took that data and put into a visual explorer that helps reporters to like tips and other sources. So really great content there.

The AP is also using this to smartly analyze what parts of the ring will yield a really great photo. And so this boxing match was captured by one of AP's AI-powered cameras.

And in 2016, Google worked with USC and the Geena Davis Institute to build a tool that would help measure gender bias in film.

So here's just a round up, and I would encourage you to maybe, like take a screenshot of this, but here's machine learning use cases. So it's a round up, so you can use machine learning for metadata tagging, or sentiment analysis, or speech to text. You can use it to classify information from, say, like photos, videos or text content. You can use it in translating, and you can use it to even create content. So there's a wide spectrum of opportunities to use machine learning in journalism. And so these are avenues that you might consider as you're thinking about applying this to your journalism or maybe building something new.

I just want to shout out a really great source, and it comes from Quartz. It has a really great AI studio, so that's one great place that you can just kind of keep up with updates about AI and machine learning in newsrooms.

Now, I'd be remiss not to mention deepfakes and disinformation, so there are challenges and dangers derived from artificial intelligence. And I won't go too deep here, but I just want to surface that this is something that we are aware of. And so there is the nearly famous example of the Obama deepfake. I'll play that really quickly. (Plays video.)

So that was Jordan Peele doing his Obama voice and a deepfake of Obama talking. And so, you know, it gets really interesting. And here's another example of an actor doing Arnold Schwarzenegger and Pacino voices, impersonations, and seeing that his face actually is changed to resemble the actor that he's impersonating.

And then here's just the title alone. "Art Meets Artificial Intelligence," being able to see an artificial sample or example of music by a famous musician.

So at this time, what I'd like to do is just kind of show you at least a practical example of Project Backlight and how we at Google are testing using machine learning and text analysis in journalism. And so Backlight allows users to quickly search through thousands of documents, and so you can, as a user, upload your PDFs or those FOIAs, and it's going to be able to analyze thousands of those. And the analysis can be performed on several file formats, including PDF, Microsoft Word, PowerPoint, plain text, images, emails, and yes, even audio.

The tool allows you to see the big picture, so you'll notice that in this interface, there's all the documents. In this case there were 30,788 JFK assassination records. And so it's already filtered the documents by people, organizations and locations. So using machine learning and uploading these documents, it's going to analyze them and then categorize them in a way that helps us as journalists sift through all this information in a way that can help inform our journalism and really kind of save lots of time.

Great. So that's Project Backlight, and at this time, what I can do, if you're interested in that, is there's a sign up. So we welcome you to to go to goo.gle/getbacklight, and you can sign up for the waiting list.

And if you have any questions about that, you can email MeganChan@Google.com or myself, and my email is GrantMichael@Google.com.

I just want to make a quick shout out that you can also test out other tools by going to the g.co/newstraining website, so this is a free website for journalists to use. You can go in your spare time and check out other trainings that are in things like data journalism or environmental journalism. And we're always adding new modules there. So check that out and visit on your own time when you'd like.

So at this point, I can kind of close out and open up for questions, but here is all the ways that you can contact me and the Google News lab. Here's my direct email. So, again, if you're interested in Backlight, feel free to email me directly at GrantMichael@Google.com. And so thank you so much. And at this time, we can go ahead and open for questions.

So when you want to use voice typing, here is the method. You go to tools, voice typing. It'll give you this little icon here. But there's a drop down, it says English U.S., but now you can see that we can scroll to the language that we would like. And it looks like they've added more than 40 now. So adding more all the time, and you can position this where you would like it. OK, great. So that's how that works.

So, you know, I think this conversation is to kind of establish a baseline for what is out there in journalism and our goals to support the development of using some of those technologies, and so we're always going to use our journalistic integrity. I don't have any specifics on how to answer that specifically. But you're right, I think your questions are right.

How do we use machines to enhance our work for those in corporate or public information?

Yeah, so now that we're at the close, it looks like I got this question a little earlier, so we did share some openly public products that are out there. And so I think it's about using our creativity. I often see that, you know, there might be a tool used for one thing, and we

try to repackage it and use it for another. And so that might even be a great way to start to figure out what we might be able to build within our own news organizations, or in this case, corporate or public information.

Does machine learning differentiate accurate versus inaccurate information?

I think you may have to check with that team specifically on their particular approach. And you're always going to want to check maybe like the methodology or the docs. So if you're a developer or interested in more about the development of particular applications, if it's open source anyway, there's going to be some really great documentation about approaches.

What concerns are there about biases being built into machine learning, channeling attention to certain content?

You know, I know that, and I'm just drawing from things that I know at this point, so ProPublica, for instance, did some really great reporting about an application that was being used in courts. And so Blacks were being convicted at a higher rate based on what a machine was able to surface about them. And so, you know, I think it's our job as journalists to figure out and investigate the performance of different types of models that are being created or other machine learning use cases. And so I think that really speaks to the importance of having more technologists doing this important work so that we can be the check on things like technology.

All right, I've got about five minutes left, just going to try to source the ones that I know I can give a really great answer to. So voice typing is only on the desktop version.

Do you think machine learning will be able to produce and understand content or messages using something like sarcasm?

I know that there are a couple of projects that I've seen, and I can get back to you on that. And for anyone who might have a particular question, you can always direct it to me as well at GrantMichael@Google.com. But I'd love to surface those instances where that's being played with. I know that Pudding.Cool, The Pudding, has done something with Elmo emojis, and so they are using sentiment or emotion to like measure and show visually sentiment and sarcasm. So that that's kind of cool.

How much coding knowledge is required to use Google's AI and ML products in reporting, and if some is required, are there good resources and tutorials for getting hands dirty?

That's a great question. I mean. In my exploration, so I'm basically a front-end coder, I'm not a programmer specifically, and so when I did my fellowship at Stanford, for instance, I ended up in a class called the Lean Launchpad. I worked with Titus, who was also a fellow during my year. He's with Tamedia Media. And so we explored personalization. He's written about it extensively. And so I think if you check out Titus Plattner and some of his post about personalization, I think he can give you some really great ideas about how to introduce yourself to that world.

And if you can't program it yourself, it might be great to team up with programmers who can and start to enter your way to what it's like to experiment. And I've written a Neiman piece a couple of years ago about the importance of experimentation in journalism. So check that out as well, because it might be a great primer.

I'm sorry that I can't get to everyone's questions right now, but I really hope that you enjoyed spending some time with us. There's a lot of information here and apparently this is being reported. So feel free to come back at me with questions. DM's, I'm cool with those. And thank you so much for having me. I really appreciate spending some time with you, and enjoy the rest of the conference.

Mallary Tenore Great, thank you so much, Michael, for being with us. That was really helpful and informative and really interesting just to see how a lot of the organizations that we know and in some cases some of the workshop attendees may work for are really using AI. So I especially liked the projects that you shared from Vice and Trent and Chequeado. Really interesting to see how AI is shaping the way that we tell stories and engage with audiences and personalize the news. So thank you so much, Michael. Really appreciate it. And thank you again to Google News Initiative for sponsoring this workshop.

So to everyone in attendance, I just want to remind you about the panels that are coming up this afternoon. So our next one is going to be at 1p.m. Central, and we'll be exploring how COVID-19 is being covered in journalism and looking at sort of how journalists can develop best practices around their coverage of it now and moving forward. And then at 4 p.m., Central, we'll be exploring sort of the importance of going beyond traditional fact-checking in the world of journalism. So I encourage you to visit ISOJ.org for more details about each of these panels, and I'm really looking forward to seeing you later this afternoon as ISOJ 2020 continues. Thank you.