

Search Off the Record - 35th episode

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[00:00:11] **Lizzi Sassman:** [00:00:11] Welcome, everyone to the next episode of <i>Search Off the Record</i> podcast. Our plan is to talk a bit about what's happening at Google Search, how things work behind the scenes, and maybe have some fun along the way.

[00:00:23] My name is Lizzi Sassman. I'm a tech writer on the Search Relations team here at Google in Switzerland. And today, I'm joined by Martin Splitt, who's also on the Search Relations team. And we're here to chat with Ryan Levering, a software engineer at Google, about all things structured data.

[00:00:37] So let's get into it. I wanted to talk to both of you-- Hi, by the way. [chuckles] I did not give you like an entry point to say hello. But hello. How are you doing?

[00:00:49] **Martin Splitt:** [00:00:49] Pretty good. How are you?

[00:00:50] **Lizzi Sassman:** [00:00:50] Good. It's good to see you.

[00:00:52] **Martin Splitt:** [00:00:52] Are you as excited as I am for the structured data conversation?

[00:00:56] **Lizzi Sassman:** [00:00:56] I don't know. Yes, probably. [chuckles] How are we measuring excitement levels?

[00:01:01] **Martin Splitt:** [00:01:01] Is there structured data for it?

[00:01:02] **Ryan Levering:** [00:01:02] There might be a <i>Schema.org</i> for it. Yeah.

[00:01:05] **Lizzi Sassman:** [00:01:05] Is structured data a method of measurement?

[00:01:07] **Ryan Levering:** [00:01:07] A representation of the actual data, yeah.

[00:01:10] **Martin Splitt:** [00:01:10] Yeah, like the Review, for instance, is a way of measuring your experience with something. Like is it a good thing, is it a terrible thing? So why not measure excitement or describe excitement?

[00:01:22] **Lizzi Sassman:** [00:01:22] Speaking of types of structured data, I was wondering if-- do you guys have a favorite type?

[00:01:28] **Martin Splitt:** [00:01:28] Ooh, I absolutely do, actually. So [chuckles] my favorite type is the Article because it's what you need to make a web story. And I like web stories.

[00:01:38] **Lizzi Sassman:** [00:01:38] It's a good thing that Gary is not here to hear you say that. [chuckles] Ryan, do you have a favorite type? Or is this like...

[00:01:44] **Ryan Levering:** [00:01:44] Yeah.

[00:01:345] **Lizzi Sassman:** [00:01:45] ... picking a favorite child?

[00:01:46] **Ryan Levering:** [00:01:46] What a great question. Article is a very nice thing because it's definitely a widely-used type, I would say. But I would say if I had to pick my favorite type, it would probably be Events. That was one of the best eco-systems, I think, where structured data really shined for Google, just the way the data is distributed on the web. And the problems that we've had consuming it make Events a really good-structured data vertical, particularly for Search.

[00:02:14] **Lizzi Sassman:** [00:02:14] You know, I think that Events was actually my first documentation project when I joined the Google Search team. And structured data was my first larger project to work on a structure for the structured data docs. [chuckles] I'm sorry. They were all not using a consistent format.

[00:02:34] And Events was, I think, launching at the time, so it was a new doc. And I used that as a way to pile it out, how we would do the ordering of the information in the structured data docs, and that's actually how I first heard of structured data. I did not know it was a thing before working on the docs, which is a good

thing.

[00:02:54] Often, as a tech writer, you're first to the scene for a feature or something and you can have the eyes as a beginner to see something for the first time. But I was wondering what your first introduction to structured data was.

[00:03:08] **Martin Splitt:** [00:03:08] For me, it was actually microformats. And I didn't realize that this would be also considered as structured data. And then the first time I probably heard "structured data" as a term coming from Google was with Google Now.

[00:03:22] I don't know if you guys remember Google Now. This wonderful thing that's basically Google Assistant before it was Google Assistant, where you could have emails that contained JSON-LD or Microdata with, for instance, event markup. And then Google would prompt you like, "Hey, you have to leave now to get to this event that is happening in an hour." So that was my first touchpoint.

[00:03:45] **Lizzi Sassman:** [00:03:45] Ryan, I think your touchpoint goes a little bit further back in time because you have told me that you had a thesis paper.

[00:03:52] **Ryan Levering:** [00:03:52] Uh, yeah. So the thesis paper was not on structured data, per se. It was on web page classifications. So machine learning and web pages have been in my background for a while. But I would say-- I mean "structured data" is a really funny term. Because we use it in strange ways at Google.

[00:04:10] I mean a database is structured data to some degree. And I think that could be confusing. Usually when we say "structured data," we are a little bit overlapping with markup as a term. So structured data that's embedded on web pages or structured data that's in some standardized form.

[00:04:27] **Martin Splitt:** [00:04:27] Yeah, I mean HTML is structured data. Yeah.

[00:04:30] **Ryan Levering:** [00:04:30] Yeah. HTML is also structured data.

[00:04:32] **Lizzi Sassman:** [00:04:32] Markup too or Schema, like we're using-- Sometimes I hear structured data markup or Schema markup or like all combinations of these words to refer to this thing. But they could also be things on themselves anyway.

[00:04:46] **Ryan Levering:** [00:04:46] The terminology is a little bit strange. But usually, we mean it in terms of as comparison to unstructured web data, is usually where it's used.

[00:04:54] So like unstructured text or other things that we're not indexing in the same way. So structured data, usually you can do more interesting things with it. Because the data has-- you don't have to worry about parsing it, and understanding its meaning because it's already semantically there.

[00:05:11] **Martin Splitt:** [00:05:11] Alright, so the way that I think of it-- and correct me if that's right or wrong-- I think the structured data in terms of markup like HTML and whatever is out there in the web, that's like human-readable. And then we have a machine-readable form as well, and that's what I would classify as structured data.

[00:05:29] Like something that is addressing the machine like the search engine, for instance, rather than the human going on a website. Because we're not showing the JSON-LD to people, right?

[00:05:38] **Ryan Levering:** [00:05:38] Correct. Yeah, that's a good way to think about it, I think.

[00:05:41] So, my introduction, when I started at Google, we were working on extraction from web pages. So like doing it via ML. So we came in, and the first thing I worked on was the data highlighter product, which is externally. We were looking at web pages and pulling structured data from unstructured text, and my whole team was very into the actual ML aspects of it. So how do we extract data, which in academic circles is often called "wrapper induction"?

[00:06:10] So when you take the-- you build a wrapper that can pull the data out of a template. So reverse engineer the database. But after several years of working on it, there was another project that was side by side that was extracting structured data, which became the core of what we use now.

[00:06:26] And I became convinced, after talking to people for a long period of time that, it was much easier

to just ask people to give us their data rather than to pull it off of the web pages. It's surprisingly more accurate. There's other problems that can happen because of that, but it's generally an easier thing to do. And it's a lot less work for us, and it's a lot better for the provider.

[00:06:47] So I came to it from ML and seeing structured data as the enemy at first. And then I was won over as a good mechanism.

[00:06:55] **Lizzi Sassman:** [00:06:55] Wow, structured data as the enemy! [chuckles] I don't think I ever imagined that you would say that. You were like the poster child of structured data.

[00:07:04] **Ryan Levering:** [00:07:04] Probably because I started on the opposite side. So I became convinced. I think that makes a more loyal follower.

[00:07:09] **Lizzi Sassman:** [00:07:09] So we've been talking about how machines use structured data to understand the content of a web page, which is oftentimes how we explain the concept of structured data, like what it is and why we would need to do this.

[00:7:22] What do we mean by understanding, and how much of it is machine learning versus this other thing that you've been mentioning? Like we're removing away from machine learning models to providers telling us exactly what the data fields are. It sounds like machine learning to me.

[00:07:37] **Ryan Levering:** [00:07:37] No. So machine learning is-- I see as like multiple prongs in our approach for how we get stuff. We want to use machine learning for cases where either we don't have more information where it's not provided for us. But it's always going to be easier to just have the data shown to us, I think.

[00:07:58] So we will try-- I think it's like a multi-tiered approach, where you have machine learning for cases where we don't have that data specifically. But then providers always have the option of giving us data, which usually improves accuracy, which usually gives better benefit for the actual provider. So I always see them as working side by side in an ideal world.

[00:08:19] **Lizzi Sassman:** [00:08:19] I see. So you don't-- you still have-- Well, you don't have to do anything. But if you want to give us more specific information, then you would use structured data. But we're also trying to do it for you, say if you don't have the time or bandwidth to add it to your site?

[00:08:34] **Ryan Levering:** [00:08:34] Most of our features over

time migrate to that approach where we ingest it. Maybe we start with one approach where we're just using ML. And then we eventually add markups so people have control. Or it's the opposite way around. And we start-- we bootstrap with markup in an eco-system approach where people are giving us data. And then we enhance coverage of the feature by adding ML long run.

[00:08:58] So, I see them as very compatible. But it's always good to empower people who are giving you data, to have control over that. So I think it's really important that structured data in general is part of the overall strategy so the people can actually have some control over the content that we show.

[00:09:14] **Martin Splitt:** [00:09:14] Yeah, also speaking of control, I guess we can never probably just use one of the tiers because I'm guessing people will also try to exploit the ability to give us data, to give us incorrect data to boost their sites in a non-valid way or like to gain the system. So I guess that's also a challenge that we're looking at. Is it? Or am I wrong and everyone plays nicely on the internet?

[00:09:41] **Ryan Levering:** [00:09:41] No, no. That's what I alluded to before as there being other challenges in structured data. The primary challenge is that we then have to figure out a way to verify that the structured data is accurate.

[00:09:53] And sometimes this is from actual abuse. And sometimes this is just because there's a problem with synchronicity. Sometimes people generate structured data for their websites and it becomes out of sync with the actual stuff that's being shown visually. We see a lot of both. So there needs to be other mechanisms to figure out some balancing act where those things are enforced.

[00:10:16] So that's the cost of structured data, I guess, is that extra checking.

[00:10:20] **Lizzi Sassman:** [00:10:20] Okay, so I'm bought in with the fact that structured data is important to

Google. But there's so many types that are out there, like Google and the documentation. We've got 25 different features or more in the Search gallery. And then there's also unlimited, almost it seems on *Schema.org*, more properties for each of the features and then more things than we even talk about.

[00:10:42] It seems overwhelming. Would you have advice for someone who's starting out with structured data-- "I don't have anything on my site, what should I add? What would be the first place to start or even the most impactful thing to add to my website?"

[00:10:56] **Ryan Levering:** [00:10:56] So most of our features right now, especially in the documentation, sort of fall into a category of specific entity type. Or like generic website structured data. So several of our features that you see there are like breadcrumbs, sitelinks search box. Those are very generic, and they apply to most websites and web pages.

[00:11:19] So checking out those in general. And then seeing whether or not we have documentation for a specific type would probably be the next thing. So if you're-- I mean definitely if you're an event site, you should definitely be looking at the event structured data page. If you're a commercial-based website, looking at that. Our review snippets is very popular with a bunch of different verticals.

[00:11:41] So having the possibility of showing up in Search with star ratings are very popular. I would browse a documentation and realize that some are generic features and some are like more specific features.

[00:11:56] **Lizzi Sassman:** [00:11:56] And what's the difference between the Google documentation and the *Schema.org* documentation? Because it does seem like there's overlap but also there's more on *Schema.org*. And why do we have both of them? When would I look at the Google one versus the *Schema.org* site?

[00:12:13] **Ryan Levering:** [00:12:13] Yeah, that's a very good question. I think there's a lot of confusion about the difference between the two things.

[00:12:18] *Schema.org* is a collaboration between multiple companies to create a common vocabulary. That vocabulary is not by any means an API. So it doesn't ever say that things are required for a particular pipeline of ingestion. So it's just a way of expressing information.

[00:12:42] It doesn't even really express cardinalities. So you could have multiple Booleans attached to a particular thing, which maybe now, it doesn't even make sense. But there's no restriction on that in the actual *Schema.org* documentation. So it's very expansive, and it has to account for all of the different use cases that could be used for it.

[00:12:59] **Lizzi Sassman:** [00:12:59] So is it like looking at a dictionary? Like these are these things, they are here. And the application of those things could be limitless or like other people can then use this to then say, "We need this type of information to do this thing." Or that's the Google aspect, it's that it's adding the "This is what we can do with it if we know this information."

[00:13:20] **Ryan Levering:** [00:13:20] Yes. So Google imposes a set of restrictions on top of *Schema.org* to make the data more usable for our purposes.

[00:13:31] So we never want to say that the data is incorrect. But it may not be viable for a particular feature. And that's what most of our documentation are reporting, is trying to convey, is that we can't use this structured data for this feature. It does not mean that it is incorrect. It does not mean that we will never find it useful or that somebody else might find it useful. It just means that, for this given feature, we can't use it. *Schema.org* is very broad. And we're more specific to the feature.

[00:14:04] **Martin Splitt:** [00:14:04] It's very interesting that you say like we might not use it or it might not be useful because I think one of the things that I found quite interesting is that when I look at the Web Almanac project from HTTP Archive that does like a yearly crawl of homepages.

[00:14:21] Now, homepages do usually have a bit of structured data as well, but it's very specific. For instance, the breadcrumbs, the navigation items. But also a lot of people add websites, like the entity websites to their homepages, and I'm always like, "Huh? What?" Like, "Hmm."

[00:14:42] It's interesting that people do it, it makes sense because, yes, of course, example.com, that is a website. And adding the structured data never hurts. But is structured data useful beyond what we use for,

say, certain search features such as rich results?

[00:14:59] **Ryan Levering:** [00:14:59] Yeah, the website is definitely used a lot. I think sitelinks search box currently uses website to hang off of. So there is one feature that actually uses that specifically for the search actions. So the answer is a little bit vague.

[00:15:10] We can potentially use that for some things at Google. And I don't-- I never advise people to not put structured data on their web page if it makes semantic sense. Because it also goes into our exploration of what might be possible in the future. So if everybody uses a particular data type and we see it being popular, then that might actually drive feature development.

[00:15:35] So one way that putting it on your website is that it lets us know there's a bunch of this stuff out there and so we might start consuming it in the future. So that's one way that it's useful.

[00:15:45] We also have some things that we do to generally understand the topic of the page. And sometimes the data you put on that can go into that. Now that's a very ML sort of process, where we look at all of the text on the page and we look at other things that have to do with the page.

[00:16:06] So structured data is just one signal in that overall calculation. But it can help us with certain disambiguations in terms of what the actual page is about. So it is useful but just in a more implicit sense right now.

[00:16:19] **Lizzi Sassman:** [00:16:19] Not as obvious to people since most of the features that we talk about are very rich result-driven. Where we say if you give us this information, we could show your site in this type of presentation, but there are other things that are not necessarily something that you could see visually. But it could help us know that this is a recipe page when I didn't know based off of other information. It's sort of interesting that we still need that kind of hint.

[00:16:48] **Ryan Levering:** [00:16:48] Yeah, and it's tricky because, like I said, if you don't put structured data on your page, we might be getting it fully correct. So it's hard to convey that in some of our reporting and stuff that we actually find this useful. Because it's a nuanced calculation. But when there is problems detecting it, we can use it as an extra signal. So it's usually on the edge cases where we find that stuff useful.

[00:17:12] **Martin Splitt:** [00:17:12] That's really, really cool, and I think it's generally easy to say like more data, as long as it is correct and reflects what's shown to the user on the page, is never worse, right. It's always better to add more data to clarify what the content on the page is.

[00:17:31] **Lizzi Sassman:** [00:17:31] Yeah, I mean that's something that we've been very cognizant about. Like if we do change something in the documentation where it's like, "Oh, we no longer need this piece of information." If we remove it from the recommendations, then will people think, "Oh, should I remove this from my website completely?" Like it's no longer useful, which is not necessarily the case because there could be other tools or systems out there.

[00:17:56] Like not Google using the structured data, and if that's gone from your website, then there's less information just generally available on the web. And it's interesting how sometimes the implication of that just spirals into this other realm.

[00:18:11] But

I have added structured data to a couple of the pages in our documentation. So I've done FAQ, and I've done How To. And I also did Breadcrumb. But everything has been like a manual approach, where it's like I take this one page and then I'm adding it in Microdata, line by line. And I haven't approached it from a massive site.

[00:18:37] But I'm assuming that would be something where SEOs and developers need to collaborate on, reading the requirements and the content that goes into the fields versus like how do you say where the fields are injected. And I know, Martin and Ryan, you've both worked together to write documentation for how you can systematically generate this.

[00:18:58] **Martin Splitt:** [00:18:58] Yes, we've done that. And it's super interesting because a few things that Ryan said in the podcast right now reminded me of the discussions we had to write this documentation, because it is not always easy, it is not always simple. I think that's why lots of people use CMSs because then they have solutions that can blanket apply structured data to a large number of pages and a large number of types of content.

[00:19:29] Then Ryan reminded me like, yeah, but how to ensure that there's no drift between what is on the page and what is in the structured data so that they stay in sync? And I'm like, "Ah, okay, that's actually not necessarily easy." Because there's different ways of dealing with that, right. So your CMS can allow the user to create content and then actually tag it in a way that is represented as structured data on the page later on.

[00:20:01] Like, for instance, when you have a recipe blog, and you have a CMS, and you add a new recipe to it, then there might be additional fields besides the full text that you put in that asks you for all the information that's necessary to express this unstructured data as a recipe as well.

[00:20:17] Or you could build something into it that pulls the data. As Ryan said, in the database that feeds a dynamic website, oftentimes already is structured. So there might be a database that has all this information in a structured way and we just need to express the structured data not only in a human-readable form but also automatically fill in the JSON-LD markup, for instance.

[00:20:45] And that's something that is relatively easy to maintain and do. But then there might be people who don't have as much access to developer resources as others. And then they might use, for instance, Google Tag Manager with a custom piece of JavaScript to pull out information that is already human-readable in the page and then create structured data from it.

[00:21:09] There are a bunch of different solutions, and we have a wonderful piece of documentation that explains them all and their potential positive and negative aspects. But it is not trivial.

[00:21:22] And I remember that, I think, Ryan, you were mostly worried about this-- the human-readable site and the machine-readable site to stay in sync, if that was-- or at least that's in my memory, right?

[00:21:36] **Lizzi Sassman:** [00:21:36] I do see that as like a common question as well like, "I'm updating the price on my page-- is this a problem, or how do I keep these things in sync, and will Google be upset with me if the things are not matched?" Because we also have that in the guidelines that what you have in a structured data must match the content on the page and not be spammy and that kind of thing.

[00:21:57] But what if I am just like, "Oh, I have a technical problem" or "This is a mistake" or something changed and I forgot or didn't know like, "Here, I did this site," or something breaks in the system. It seems like this could be a common problem if you're doing this kind of setup. How would you approach-- How does Google make sure to not penalize sites like these?

[00:22:20] **Ryan Levering:** [00:22:20] I think the key is to make sure that the thing that's generating-- like Martin alluded to-- the thing that's generating your content is coming from your database directly and it's not really manual. There are approaches that are more likely to stay in sync. Like if you use RDFa or Microdata, generally it is wrapping the content, so it tends to stay more in sync.

[00:22:40] Those are sometimes harder formats to actually use, and it's sometimes easier to inject JSON-LD, which is why JSON-LD is sort of preferred these days-- it's that it's harder to mess up. But if you're concerned about keeping those things in sync, I think looking at Microdata or RDFa is a good way to go.

[00:23:01] **Lizzi Sassman:** [00:23:01] What's difficult about the Microdata or RDFa? Is it because it's easier to miss a closing tag or something or like do people-- when you say people make mistakes, what is more difficult about those approaches?

[00:23:15] **Ryan Levering:** [00:23:15] Yeah, it's because you're imposing structured data semantics on top of the HTML. So your HTML is mostly being written for visual display. And then you're imposing semantics on top of that, which sometimes fits very nicely. But often, the data is structured visually in a way that you would not structure it in a feed or something.

[00:23:35] So because of that, it becomes tricky to structure it, and you have to do fancy things with Microdata that are not intuitive.

[00:23:43] **Lizzi Sassman:** [00:23:43] I've run into that problem, where there is some piece of information that the Google Docs say that I need to provide, but I don't necessarily have that on the page. Like where do I put it? And I have put it in a hidden way, but is that hidden text? Or is it fine to put it like that? Or some tricky thing where, with JSON-LD, it seems like, "Here's just a block of information," it's at the top. Like no weird moving around of the parts because the whole thing is hidden?

[00:24:07] **Ryan Levering:** [00:24:07] Correct. Yeah, yeah. We try to only do checks on the pertinent information on the structured data you're giving us. So if there's extra metadata like in JSON-LD or in Microdata, in meta tags I think you're alluding to, then it will-- we don't check for that particular stuff usually.

[00:24:25] But I just wanted to add the point on this topic that JSON-LD, one of the problems with JSON, which is addressed in documentation as well, is that we have to fetch a different resource. So that can also provide a synchronicity problem. And that's the reason why it's sometimes better to go with approaches that are embedded on the website, even at the web page itself, even if that makes it more difficult to separate, just because there's a chance that we're not downloading the JavaScript at the same time that we're downloading the HTML. So there's a chance for a synchronicity problem in that case.

[00:25:00] **Lizzi Sassman:** [00:25:00] How would I know that I have this kind of a problem? Like if I was the website owner that-- like Google is not fetching the JavaScripts part of the structured data on my page, would I get a message from Search Console about this? Or would this be completely hidden from me? Maybe this is a Martin question.

[00:25:15] **Martin Splitt:** [00:25:15] I think generally that would show up in Search, in the Search Console, no, Ryan?

[00:25:21] **Ryan Levering:** [00:25:21] No, I think it would. I think that our testing tools will actually show that...

[00:25:28] **Lizzi Sassman:** [00:25:28] Like the whole thing is missing, not just like, "Oh, you didn't provide us this one property." Like suddenly we are not able to find this entire block?

[00:25:36] **Martin Splitt:** [00:25:36] I mean with the asynchronicity, the problem more likely is that you have some sort of invalid and broken template that hasn't been filled in yet. And then we'd be like, "Hmm, this doesn't look right."

[00:25:47] **Ryan Levering:** [00:25:47] So it might be a little confusing actually.

[00:25:47] **Lizzi Sassman:** [00:25:47] To know that it means that it's the synchronicity problem. We know-- like it's easy to see that there is something wrong here, but what is the culprit? The next question, it might be a little bit harder to debug.

[00:25:58] **Martin Splitt:** [00:25:58] Yeah, definitely. Because you would have to look into the testing tools. The testing tools might not... Because this, again, kind of like a race condition. So multiple things happen at the same time. And depending on what takes how long, the order might change. And then in the testing tools, it might look like this. But then when we did it in the indexing pipeline, it looked different.

[00:26:20] And then catching that is non-trivial. That is actually-- it requires a bit of experience and digging, I would say.

[00:26:29] **Ryan Levering:** [00:26:29] That's definitely gotten better over the last couple of years, though. We've done a lot of work of reducing the cash time for some of the data fetches, which has helped structured data out a lot.

[00:26:37] **Lizzi Sassman:** [00:26:37] Yeah, speaking of the work that has been done, what about the work that's to come, the next couple of years for structured data? If you were to give us a peek into the future, what is next for structured data?

[00:26:50] **Ryan Levering:** [00:26:50] In the medium-term, I think we're... I mean we continue to flesh out the structured data usage in terms of adding more features and looking into more ways we can use it in cooler things that are not just visual treatments but actually help with more understanding on the page, I think.

[00:27:07] And figuring out how to use structured data more universally in a lot of our features rather than just like here and there, scattered around. I think that's what we're looking at in a medium-term.

[00:27:20] Long-term, I think that it's going to play a really interesting role at interacting with the way that we interpret it in general into our internal graph. So I would like to see more machine learning, figuring out-- I would like to move to where we are adjusting more and more data through structured data-specific channels rather than necessarily conveying all of our information on the web page itself.

[00:27:48] So I think that's a much cleaner approach, particularly for some of our structured data ingestion paths. So figuring out a way to get around the actual visual representation and figuring out ways to link the structured data with the web page but not necessarily embed it on the web page. So I think there's a cleaner way to do data transfer between data providers and Google.

[00:28:11] **Lizzi Sassman:** [00:28:11] Would this also potentially make it easier for new website owners to benefit from some of these, I don't know, enhancements at Google, if we were to be able to pull the information in a different way?

[00:28:25] **Ryan Levering:** [00:28:25] I think that it will make it easier for plug-ins and CMSs to create that information particularly. Because I feel like a lot of the eco-system has moved in that direction where people aren't implementing the structured data themselves but rather are using content creation tools.

[00:28:43] I think it's becoming more important that we have mechanisms to work directly with those content creation tools to ingest the data in a programmatic way in order to make it fresher and easier.

[00:28:56] **Lizzi Sassman:** [00:28:56] Excellent, well I'm...

[00:28:57] **Martin Splitt:** [00:28:57] That sounds exciting.

[00:28:58] **Lizzi Sassman:** [00:28:58] ...looking forward to working more with you and hopefully more structured data documentation for general usage. We're so happy that you joined us here on this episode.

[00:29:08] ♪ [music] ♪ [00:29:08]

[00:29:12] **Lizzi Sassman:** [00:29:12] And that's it for this episode. Thanks for joining us here, folks. We've been having fun with this podcast. And I hope you, the listener, have found it both entertaining and insightful too.

[00:29:21] Feel free to drop us a note on Twitter <i>@googlesearchc</i>. Or chat with us at one of the next virtual events we go to, if you have any thoughts. And of course, don't forget to like and subscribe. Thank you and goodbye.

[00:29:33] ♪ [music] ♪ [00:29:33]